TAMASOMA JYOTIRGAMAYA
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THE BLUE PRINT

Department of Civil Engineering, VNR VJIET

Volume II 2017-18

In this issue

DEPARTMENT OF CIVIL ENGINEERING

VISION

To develop Civil Engineering Department as a Centre of Excellence for imparting value based education to the students at under-graduate and post-graduate level to meet industry needs and to develop as a major research centre to meet the national and international standards

MISSION

- To impart in-depth and up-to-date knowledge of Civil Engineering, stressing concepts with focus on character enhancement, leadership qualities, effective communication, social responsibility, pursuit of lifelong learning and professional development.
- To provide a platform to students to engage in innovative research work

Department of Civil Engineering Faculty and Staff

Principal's Message

It is my pleasure in congratulating the editorial board on this pleasant occasion of releasing the second issue of the newsletter. The Newsletter serves as an abode of information in recent advancements and developments in the field of Civil Engineering that may help the students to explore and exhibit in their desired specializations. It would definitely be an inspiration and motivation for the readers to perform better and add on their contributions in the forthcoming issues. Civil engineering is the field of engineering sciences, related to design, construction and maintenance of buildings, dams, bridges, tunnels, highways and other structures by the use of physical laws, mathematical equations and theories of mechanics. Civil Engineers utilize the available resources to complete the task in the given time keeping in view environmental issues and physical hazards of the task. The newsletter is a forum to converse and disseminate information on these issues. This edition highlights the hidden talents of students and staff in promoting the achievements in various innovative approaches. I congratulate the team in their efforts in bringing out this newsletter.

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Editorial Note

The Civil Engineering Department of VNRVJIET is in a period of rapid growth and diversification that is strengthening our influence within the VNRVJIET community, Hyderabad, and the broader state and the nation. I am pleased to present to you this second edition of the newsletter which highlights a few of these activities. Department is recognized as Research Centre by JNTUH and Department is awarded with GHMC Third party quality control works consultancy. Two in house faculty are awarded with Ph.D. (IITM, NITW) in 2018 and 4 more have joined the list of pursuing. We also have added one outstanding Distinguished Visiting Professor Prof. M. R. Madhav to our Civil Engineering family at VNRVJIET to mentor us. I take pride in our alma mater for their contributions with financial support (special acknowledgements to Mr. Rishi Tirupari) to economically week and meritorious students and mentoring through motivation and guidance lectures. Department laboratories are added with new equipment in Strength of materials, Geotechnical and Transportation labs. One DST Project was sanctioned under Device development scheme worth Rs.12.00 lacs to Dr. A. Ramesh. Our students are placed in the core sector with 55 placements this year. Our team is making continuous efforts in exploring new teaching and learning methodologies and forwarding research contributions. I congratulate the entire team for their sincere and continuous efforts in taking the Department into the track to achieve its vision.

DEPARTMENT NEWS

ACHIEVEMENTS:

- CAD- eploy has established center in the department on 28th December 2017.
- Launched Newsletter -THE BLUE PRINT first edition on 26th February 2018.
- Department of Civil Engineering is recognized as research center by JNTUH on 2nd April 2018.
- Received grant from DST under Device Development Scheme on 11th June 2018.
- Department of Civil Engineering is accorded with third party quality control consultancy services by greater Hyderabad municipal corporation (GHMC).

Launch of Newsletter THE BLUE PRINT- FIRST EDITION

Dr. A. Ramesh accompanied with students In GHMC Work

Dr. R. Durga Prasad involved in Slump testing

D. Anil Kumar collecting Concrete samples

Dr. K. Ramujee & Mrs. M. Jyothi at site inspection

NEW FACILITIES CREATED:

The following are list of equipment procured in 2017-2018:

S. No	Name of the laboratory	Name of the Equipment	Date of Procurement	Amount (Rs.)
1	Transportation Engineering	Asphalt Mixture Density Meter	29/09/2017	76,700/-
		Repeated load test apparatus accessories: i) 2 LVDT'S ii) 8 Channel DAQ and its Software	20/02/2018	4,00,421 /-
2	Geotechnical Engineering	Sieve Shaker	23/06/2018	1, 59,300/-
3	Material Testing Laboratory	Digital Compression Testing Machine	10/05/2018	3,96,657/-

BEST PRACTICES:

Department has developed sustainability dash board for VNRVJIET which includes

- Environmental auditing
- Water and energy conservation
- Promoting plastic free and paperless office

MEMORANDUM OF UNDERSTANDING (MoU) INITIATIVES:

Department has endorsed an MoU with the following industries

- Pennar Engineered Building Systems.
- SEW Infrastructure Ltd.
- Praneeth Group.
- BCPL Infrastructure Limited.

MOU with CAD Deploy Company

GUEST LECTURES:

- Dr. P. Raguveer Rao, Principal Research Scientist, IISc Bangalore, delivered a lecture on "Research activities undergoing at IISc Bangalore" on 27th July 2017.
- Dr. B.K. Parvati, Hyderabad delivered a lecture on "Positive thinking and personality development" on 23rd August 2017.
- Dr. P. N. Singh, Professor delivered a lecture on "How to Write a Technical Paper" on 5th October 2017.
- Dr. Akshay S K Naidu, Associate Professor, Methodist college of Engineering and Technology, delivered a lecture on "Structural Health Monitoring Using Piezo-Electric Impedance Sensors" on 11th November 2017.
- Mr. Shivadeep Panjwani, Head-HR, Ramky Infrastructure Ltd, shared his experiences on "Journey from College to Corporate" on 9th January 2018.
- Dr. Neelima Satyam, Associate Professor, IIT Indore delivered a lecture on "Significance of Geotechnical Site Investigations and Excavation Challenges" on 14th February 2018.
- Mr. P.S.R Koundinya, Director, M/S Peketi Ventures, Hyderabad delivered a lecture on "Employment prospective in Field of Civil Engineering" on 6th March 2018.
- M. R. Madhav, Professor, JNTUH College of Engineering delivered a lecture on "Doctoring/Engineering of Ground" on 12th March 2018.

Prof. M. R. Madhav from JNTUH

Dr. Neelima Satyam, Associate Professor, IIT Indore

Mr. Shivadeep Panjwani, Head-HR, Ramky Infrastructure Ltd

Mr. A. Manikantha Sarath, Alumni of CED

ALUMNI LECTURES:

- Mr. Rishi Tirupari, distinguished alumni interacted with students to share experiences as a Green consultant on 29th August 2017.
- Mr. A. Manikantha Sarath, Senior Section Engineer, South Central Railway Zone, delivered a lecture on "Employment Prospects in Civil Engineering" on 24th March 2018.
- Mr. Himanshu Patel, Research Assistant, Bradley University, USA delivered a lecture on "Future Opportunities in of Civil Engineering" on 27th March 2018.

FACULTY CORNER

JOURNAL PUBLICATIONS:

- Dr. A. Ramesh, Govindaraju Vijay and Kumar Molugaram,2017 "Examining Crash Variable Based on Collision Type for Predicting Crash Severity on Urban Highways" International Journal for Traffic & Transport Engineering, Vol. 7, No. 3, pp. No:381-390.
- Dr. Mallika Alapati and Preethi Venkatesh,2017 "Condition Assessment of Existing Concrete Building Using Non-Destructive Testing Methods for Effective Repair and Restoration- A Case Study", Civil Engineering Journal, Vol. 3, No. 10, pp. No: 841-855.
- G. Lalitha,2017, "A Practical Study of Non-Destructive Testing Techniques on Steel Material", International Journal of Advance Engineering and Research Development, Vol. 4, No. 10, pp. No: 763-769.
- Dr. P. N. Singh and V. Ramya Krishna and T Stuthikeerthana,2017 "Changes in Engineering Properties of Heavy Metals Contaminated Soil", International Journal of Engineering Technology Science and Research, Vol. 4, No. 11, pp. No: 1063-1066.
- D. Manjula, 2017 "Flexural Behavior of Self Curing Concrete with Partial Replacement of Cement by Silica Fume", Advance Engineering and Research Development, Vol.4, No:11, pp. No :688-704.
- D. Manjula,2017 "Performance of High Strength Self Compacting Concrete at Elevated Temperature", International Journal of Emerging Technologies and Innovative Research, Vol. 5, No. 4, pp. No: 1699-1703.
- Dr. A. Ramesh, M. Kumar and B. Srinadh,2017 "A Laboratory Investigation on Rutting Characteristics of HMA & WMA Mixes when Reinforced with Fibers", Journal of the Eastern Asia Society for Transportation Studies, ISSN: 1881-1124.
- Penki Ramu, Dr. K. M. Lakshman Rao, S Arun Kumar and Kotari Nandini Chandravathi,2017 "Modelling to Track Negative Externalities Influencing on Speed Control With GIS" in International Journal of Advance Engineering and Research Development, Vol. 4, No. 11, pp. No: 1198-1203.
- Dr. B. D. V. Chandramohan Rao and Chanakya ,2017 "Optimum Position of Outrigger with Belt Truss in High Rise Building Under Horizontal Loading", International Journal of Emerging Technologies and Innovative Research, Vol. 4, No. 11, pp. No: 270-275.
- Dr. K. Ravi kumar and P. Yaswitha,2017 "Study of Urbanization Impact on Potential Ground Water Zones of Hyderabad City", International journal of creative research thoughts, ISSN: 2320-2882.
- Dr. Kolli Ramujee and KethaKalyankumar,2017 "Engineering Properties of Binary Blended Geopolymer Concrete Made with Geopolymer Based Recycled Coarse Aggregates", International Journal of Emerging Technology and Advanced Engineering, Vol. 7, No. 2, pp. No: 86-90.

- Dr. B. D. V. Chandramohan Rao and Ch. Sai Amarendra,2017 “A Comparative Study on the Analysis of Single, Double and Triple Cell RC Box Structures”, International Journal of Emerging Technology and Advanced Engineering, Vol. 7, No. 2, pp. No: 349-352.
- Dr. B. D. V. Chandramohan Rao and S. Muhammad Anees,2017 “Effect of location of Shear Wall on Seismic Performance of RC Buildings”, International Journal of Emerging Technology and Advanced Engineering, Vol. 7, No. 2, pp. No: 86-90.
- Dr. Mallika Alapati and NeethaRautela,2017 “Seismic Behaviour of Reinforced Concrete Framed Structures with Masonry Infill Modelled as Diagonal Strut”, International Journal of Emerging Technology and Advanced Engineering, Vol. 7, No. 2, pp. No: 338-343.
- Dr. Mallika Alapati and P. PallaviSanthoshi,2017 “Effect of Openings and Aspect Ratio on RC Framed Brick Infilled Building”, International Journal of Emerging Technology and Advanced Engineering, Vol. 7, No. 2, pp. No: 408-417.
- Dr. Purnendu Narayan Singh, Srikanth Kandalai and K.K. Singh,2017“Permeability of Granular Soil Employing Flexible Wall Permeameter”, Arabian Journal of Geosciences, Vol. 11, No. 2, 1-9 (28).
- Dr. K. Ravi kumar and G. Prashanth,2018 “Ground Water Recharge Modeling of Vadose Zone Using Hydrus – 1D: A general model”, Journal of Emerging Technologies and Innovative Research, Vol.5, No.2, pp. No: 220-224.
- Dr. K. Ravi kumar and B Jaya Ashwanth Reddy,2018 “A Study on Settlement of Particulate Matter in The Residential Colonies of Hyderabad City w.r.t. Main Road Distance”, International journal of Earth Sciences and Engineering, Vol. 10, No. 5, pp. No: 1040-1047.
- P Arti Sudam and D Kaveri,2018 “Effect of Additives on Strength Properties of Soil with Emphasis on Compaction Time Lag”, Journal of Civil Engineering and Environmental Technology, Vol. 5, No. 1, pp. No: 8-11.
- T. Srinivasa Rao, I. Naga Babu and Chandana N,2018 “MSW Landfill Site Selection for Hyderabad City Using GIS and AHP”, Journal of Remote Sensing & GIS, Vol. 9, No. 1, pp. No: 15-25.
- Dr. Kolli Ramujee, K Saiprasad and B Narendra Kumar,2018“Durability Properties of Ternary Blended Geopolymer Concrete Under Ambient Curing”, International Journal of Engineering and Technology, Vol.7, No.2.1, pp. No: 46-50.
- K. Suresh and SS Asadi,2018 “A Semantic Review on Operations with Fly Ash with Different Approaches in Real Time”, International Journal of Mechanical Engineering and Technology, Vol. 9, No. 4, pp. No: 934-943.
- Dr. A. Ramesh, 2018 “Development of Model for Pedestrian Gap Based on Land Use Pattern at Midblock Location and Estimation of Delay at Intersections” in Journal of The Institution of Engineers (India): Series A, ISSN: 2250-2149.
- Dr. A. Ramesh, M. Satish Goud, V. Venkat Ramayya and M. Kumar,2018 “Effect of Polypropylene Granules in Asphalt Mix Prepared with Varying Packing Characteristics”, Highway Research Journal, Vol.9, No.1, pp. No: 13-20.

- T Nagateja and A. keertana Assistant Professor published a paper,2018 “Development of Accident Prediction Model at Signalized Intersections”, i-managers Journal on Civil Engineering, Vol 8, Issue No:1, pp. No: 35-40.

- Dr. Kolli Ramujee and Karnatakam Sai prasad ,2018“Strength Studies of Ternary Blended Geopolymer Concrete Under Ambient Curing”, i-managers Journal on Structural Engineering, Vol. 6, No.4, pp. No:134-39.

BOOK CHAPTER:

K. Veerendra Gopi, Assistant Professor, presented a paper on “Simulation of Urban Drainage System Using Disaggregated Rainfall Data” in International Conference on ‘Water, Environment, Energy and Society’, January 2018, NIT Warangal.

CONFERENCES PUBLICATIONS:

- Dr.Ch. Nageshwar Rao, K. Ashok, K. Rakesh, G. and K. Viswanadh presented a paper, “Urban Water Management in Indian Cities – An Integrated Approach” in National Conference on ‘Sustainable Water and Environmental Science (SWEM-2017)’.

- Dr.Ch. Nageshwar Rao, Professor presented a paper, “Effect on CBR and Resilient Characteristics with of PET Bottle Confinement” In National Conference on ‘GeoAPPS- 2018’, JNTUH.

- Dr. C. Naveen Kumar, T. Naga Teja and Rachakonda Pranavi presented a paper, “Calibration of Fundamental Flow Model for Pedestrian Crosswalks at Signalized Urban Intersection” in National Conference on 5th Colloquium Transportation Systems Engineering and Management (CSTEM), May 2018.

- Dr. C. Naveen Kumar, presented a paper, “Crash Frequency Prediction Models and Development of Crash Modification Factors for Four Lane Highways in India” in International conference on 18th IRF World Road Meeting (WRM 2017), November 2017.

- Dr.Ch. Nageshwar Rao, Professor presented a paper, “Integrated Approach for Mitigating the Effect of Flash floods in Indian Urban Setting” in International conference ‘Environmental Management’, November 2017.

- Dr. B. Narendra Kumar, Professor presented a paper, “Durability Properties of Ternary Blended Geopolymer Concrete Under Ambient Curing” in International conference on ‘Smart Sustainable Cities’, December 2017.

- G. A. V. S. Sandeep Kumar, Assistant Professor, presented a paper, “Investigation on Orientation of Piles in Pile Caps” in international conference on ‘Smart Sustainable Cities’, December 2017.

- K. Suresh, SS. Asadi and A. V. S. Prasad presented a paper, “Leaching Behavior and Strength Characteristics of Black Cotton Soil Stabilized with Fly Ash” in International Conference on ‘Materials Processing and Characterization’, January 2018.

- Dr. C. Naveen Kumar, Associate Professor, presented a paper, “Bayesian Crash Prediction Models for Non-urban Four Lane Highways in India” in International Conference on 28th Canadian Association for Road Safety Professionals (CARSP)

- Dr. A. Mallika and Nikhila presented a paper, "Comparative Study on Dynamic Behavior of Different Building Frames Subjected to Blast Loads" in International Conference on 'Theoretical and Experimental Advances in Civil Engineering' (ICONTEACE), May 2018.

LECTURES DELIVERED BY OUR FACULTY AT OTHER INSTITUTIONS:

- Dr. A. Mallika, Professor, delivered a lecture on "Structural Health Monitoring" in a 1-day workshop on 'Recent Advances in Civil Engineering' at MallaReddy Institute of Technology, Hyderabad on 10th August 2017.

- Dr. B.D.V. Chandramohan Rao, Professor, delivered a lecture on "Concepts of Structural Analysis" at MallaReddy Institute of Technology, Hyderabad on 16th March 2018.

FACULTY SPONSORED FOR CONFERENCES/ SEMINARS/ WORKSHOPS/ FDPS/ OTHER PROGRAMS:

- J. Y. V. Shiva Bhushan, Assistant Professor was sponsored to attend a Faculty Development Program at Pandit Madanmohan Malaviya National Mission on Teachers and Teaching, IIT Bombay from 28th November to 20th December 2017.

- S. Sangeetha, Assistant Professor had attended a Faculty Development Program on 'Effective Teaching and Learning of Geotechnical Engineering Using Field Practices and Case Studies' at NIT Warangal from 6th to 10th December 2017.

- Dr. A. Ramesh, Professor was sponsored for International Conference on Fourth International Conference of Transport Research Group at IIT Bombay on 17th to 20th December 2017 and presented the paper titled - "The Effect of using Acid Modified Mixes on Performance of Asphalt Concrete".

- J. Y. V. Shiva Bhushan, Assistant Professor was sponsored for National Conference on 'GEOAPPS-2018' in JNTU Hyderabad on 24th March 2018.

- Dr. A. Ramesh, Professor was sponsored for International Conference on 'International Symposium on Geotechnics of Transportation Infrastructure' (ISGTI 2018) on 7th & 8th April 2018 and presented a paper titled – "Experimental Study on Geocell and of fiber Reinforced Soil Subgrade under Static and repetitive load".

- Mr. I. Naga Babu, Ms. K. keerthi Priya, Mrs. Ch. Suma sree, Mr. B. Manikanta Reddy, Mr. P. Ramu Assistant Professors had attended a Faculty Development Program on "Instructional Design and Delivery Systems" at VNRVJIET, Hyderabad from 11th to 16th December 2017.

- M. Jyothi & G. Anuja Assistant Professors attended three-week training program on 'Training on Modeling & Detailing Software by CAD-eploy from 29th January to 17th February 2018.

PROGRAMS ORGANIZED:

AICTE sponsored One-week national workshop on "Traffic and Transportation Planning for Smart Cities" was organized by Dr. A. Ramesh, Professor during 20th to 25th November 2017.

Dr CSRK Prasad from NIT Warangal, Dr Rajesh Krishnan, CEO of ITS Planners and Engineers, Dr.SLN Sarma Sadhu, Dr. V. Vinayaka Ram from BITS Hyderabad, Dr. K.V.R. Ravi Shankar, NIT Warangal, Dr M Kumar, Professor and Head, UCE, OU were the keynote speakers.

Inaugural of One Week National Workshop

Two-day technical workshop on Building Information Modeling (BIM) during Convergence 2k18.

Lecture by Technical Expert

FACULTY ACHIEVEMENTS/RECOGNITIONS:

- Dr. A. Mallika, Professor, is journal reviewer for "International Journal of Civil Engineers".
- Dr. A. Mallika, Professor, Board of Studies member at JNTUH.
- Dr. A. Ramesh, Professor is journal reviewer for "Journal of The Institution of Engineers".
- Dr. A. Ramesh, Professor received funded project approval from DST under Device Development Scheme for Rs. 12 Lakhs fund in June 2018.
- Dr. K. Ravikumar, Associate Professor, chaired a session for CE paper presentations @ 2nd National Conference on Engineering Science and Technology in Industrial Applications and significance of Free Open Source Software organized during 21st- 22nd December 2017.
- Dr.Ch. Nageshwar Rao, Professor chaired presentations session 3 in National Conference, GEOAPPS-2018 held at JNTU on 24th March 2018.
- Dr. Kadali Srinivas, Associate Professor, is book reviewer for "Ground Improvement with Geotechnical Site Investigation" in Elsevier S&T Books.
- Dr. Kadali Srinivas, Associate Professor, is book reviewer for "Analysis and Design of Soil and Rock Excavation" in Elsevier S&T Books.
- Dr. Kadali Srinivas, Associate Professor, is journal reviewer for "Arabian Journal of Geosciences".

FACULTY NPTEL ACHIEVEMENTS:

J Y V Shiva Bhushan, Assistant Professor have received Top Performing Mentor Certificate from NPTEL for the course Soil Mechanics/Geotechnical Engineering- I during January - April 2018.

SOCIAL IMPACT PROJECTS:

- Feasibility report on "Monitoring the sufficiency of drainage system for a rapidly growing village (Pragathi Nagar)".
- "Development of Eco-friendly system to control the growth of water Hyacinth Plants" to revive the lake ecosystem.
- A new initiative "VNR EXPRO" to promote technical education in schools, to enhance and enable young excited students from Silver Oaks International School, Bachupally.

LABORATORY COURSE PROJECTS:

- **232** course-based projects were conducted in the academic year 2017-2018**.**

Dr.C. D. Naidu, Principal at projects Expo

STUDENT CORNER

INDUSTRIAL VISITS:

- Students of 2nd B. Tech visited Survey Training Institute, Uppal on 20th October 2017.
- Students of 3rd Tech visited Preca Solutions India Pvt Ltd, Hyderabad on 12th October 2107.
- Students of 3rd B. Tech visited PEBS Pennar Engineered Building Systems Ltd, Hyderabad on 15th March 2018 & 16th March 2018.
- Students of 3rd B. Tech visited Jaidhar Construction (RMC Division), Hyderabad on 16th February 2018.
- Students of 4th B. Tech visited National Centre for Ocean Information Services (INCOIS) Hyderabad on 6th November 2017 to learn about earthquake and tsunami monitoring activities.
- Students of 4th B. Tech visited CII- Shorabji Godrej Green business center, Hyderabad on 16th October 2017.
- Students of 4th B. Tech visited M/s. L& T Constructions, Hyderabad on 4th April 2018.

Students at PRECA

Students at PEBS Pennar

STUDENT ACHIVEMENTS:

- V. Manoj and T. Mounika of 2nd B. Tech has won 2nd prize at the event Sur-Warriors zone (surveying) at Acumen Fest at Vasavi College of Engineering.
- T. Mounika of 2nd B. Tech won 3rd prize in the event Town Planning at Acumen fest at Vasavi College of Engineering.
- Manjot Singh Gandhi of 3rd B. Tech, stood third in Technical Quiz on "Innovative Technologies for Water and Waste Water Management" at 'The Institution of Engineers' on 21st March 2017.
- Manjot Singh Gandhi of 3rd B. Tech, secured 96% in Enhancing Soft Skills and Personality and 94% in Soil Mechanics/Geotechnical Engineering -I, NPTEL Courses.

- Yallabandi Harshini of 3rd B. Tech, secured 94% in Soil Mechanics/Geotechnical Engineering -I, NPTEL Courses.

- Ahmed Sameed, M. Aravind and R. Vishal of 3rd B. Tech bagged first place in "Concreting event" conducted during 'Technozion' at NIT Warangal.

- Ch. Ravi Teja of 3rd B. Tech won second place in "Concreting event" conducted during 'Technozion' at NIT Warangal.

- Ch. Ranjith of 3rd B. Tech, won first prize in quiz competition conducted by B. Tech Guru on Aug-Oct ,2017.

- Sushant of 3rd B. Tech bagged 2nd prize in Paper presentation on the topic Graphene Oxide Reinforced Concrete at ELAN, IIT Hyderabad.

- Archith Chandra and Kolla Nikhil of 4th B. Tech, Bhavishya of 3rd B. Tech and K. Amrutha of 2nd B. Tech have been winners of Hyderabad Hop Convention 2018, runners at NITW Spring Fest 2018, runners at SNIST Sreevision 2017 and 2018.

- Shaik Abdul Manan of 4th B. Tech, won gold medal in Athletics Men 4 X 100 Meters Relay Run at sports meet, BITS Pilani Hyderabad Campus on 25th-28th January 2018.

- C. Mrunalini Reddy of M. Tech, Geotechnical Engineering represented Telangana state in 68th Senior National Basketball Competitions 2018 on 17th January 2018.

Ahmed sameed, M. Aravind and R. Vishal receiving cash Prize at NIT Warangal

T. Mounika and V. Manoj receiving award at Vasavi College of Engineering

Shaik Abdul Manan, National Athlete with his team

C. Mrunalini Reddy played Federation cup Senior National basketball Meet

Shaik Abdul Manan won gold medal in Athletics Men 4 X 100 Meters Relay Run

CIVIL ENGINEERING ASSOCIATION (CEA) & INDIAN CONCRETE INSTITUTE (ICI) STUDENT CHAPTER

CIVIL ENGINEERING ASSOCIATION:

CEA is a student chapter of Civil Engineering Department of VNRVJIET. Department also has registered student chapters.

ORIENTATION: The freshers joining the department are introduced to the chapter through various interesting activities.

REPUBLIC DAY: On republic day, a march parade was organized by all the student chapters with the theme "UNITY IN DIVERSITY".

Republic Day Celebrations

WORLD WATER DAY:

World water day is celebrated by Civil Engineering department to educate and to promote awareness among students to realize the importance of water and necessary actions to be taken to save water.

EVENTS: Various technical events were conducted and prizes were distributed under the banner CEA (ICI-IGBC).

- Event 1: - Orientation for 2nd ,3rd & 4th year students on 08-07-2017
- Event 2: - Battle of Brains (Quiz) 20-07-2017
- Event 3: - Design the D-block courtyard (10-08-2017)
- Event 4: - Typo-tech (24-08-2017)

Orientation by CEA student member

Prize distribution

Participation of students in Typo-tech event

Participation of Students in Battle of Brains event

Participation of students in Design the D-block courtyard

DISTINGUISHED ALUMNI:

- Mr. Rishi Thirupari of 2002 admitted batch is generous in sponsoring annual tution fee for K. Sai Charan (16071A0125), Civil Engineering student under “Rishi Thirupari Endowment Scholarship”.
- Mr. Keshav Inani of 2006 admitted batch sponsored solar panels of 500 KVA for solar fountain in D-Block open space.
- Mr.M.S.S.V. Harsha of 2012 admitted batch is pursuing Ph.D. at University of Toledo, USA, handling editor for International Journal for Environmental and Waste Management and International Journal of Environmental Engineering.

Mr. Rishi Thirupari

Mr. Keshav Inani

Mr.M.S.S. V Harsha

ALUMNI ENTERPRENEURS:

Graduate Name and Roll No.	*Name of the Company*
B. Mohan Krishna	CCL Products (India) Ltd.
Sai Neeraj (02071A0149)	Sri Sai Educational Society
K. Varun (02071A0156)	Asvasidh Novateur Developers Pvt. Ltd.
Sujeeth Reddy Edwin Kellwyn (04071A0141)	Jaijeeth Constructions
Kohal Mangu (05071A0113)	Renuka Advanced systems
Keshav Inani (06071A0131)	Inani Solar Solutions LLP
Rajesh Varre (07071A0105)	Shraddha Saboori Projects
G. Sai krishna (07071A0118)	GSK E-Structural India Pvt. Ltd.
P. Sushruth (07071A0128)	MAXIMIX Ready Mix Concrete Pvt. Ltd.
P. Kumarasway Reddy (08071A0137)	KSR Crest
Dheeraj Dutta (08071A0137)	Polstar Building Systems Pvt.ltd.
Gonuguntla Harish (09071A0118)	Shivashakti Biotechnology Ltd.
Harsha Abbineni (10071A0102)	Creative Homes
A. Satya Prakash (10071A0111)	ARC Developers
D.Laxmi Sneha (11071A0107)	Trident Powdertech Pvt. Ltd.

- Department interaction with alumni on 19th ALUMNI HOMECOMING DAY-YUGMA'2K17

YUGMA'2k17 -Alumni Interaction

- 55 students got placed in various reputed companies.

S. No	*Name of Industry/Company*
1.	CAD-EPLOY
2.	BSCPL
3.	APARNA Constructions
4.	AMAZON
5.	CAPGEMINI
6.	MOLDTEK
7.	TATA Projects
8.	AARVEE Associates

- 15 students were pursuing their Higher Education at different Universities in Abroad and in Indian Universities.

S. No	*Name of University*
1.	University of Ottawa
2.	University of Concordia
3.	Trinity College Dublin
4.	CQ University
5.	NIT Rourkela
6.	NIT Warangal
7.	NIT BHOPAL
8.	DTU
9.	BITS Pilani
10.	NICMAR

- 15 students secured good GATE 2018 Ranks.

- A Tech Square, demonstrating the various Civil Engineering aspects created in D-Block Open Space:

  - Steel Structure Components
  - Fountain supported by solar power
  - Brick Bonds
  - Geopolymer Concrete Bench
  - Paver Bricks with Recycled Aggregate
  - Roof Top Rainwater Harvesting
  - Herbal Corner

Tech Square

ARTIFICIAL INTELLIGENCE SHAPING THE FUTURE OF CIVIL ENGINEERING

Dr. C. Naveen Kumar
Associate Professor, CED

1.Introduction

The ability of computers is transforming our lives at an increasing rate. The prospect of machines that can think, rather than just do, is something we are beginning to take for granted. The transformative power of artificial intelligence (AI) to change the infrastructure sector is only just beginning, but now is the time to assess and analyze how we can best take advantage of it.

Traditional methods for modelling and optimizing complex structure systems require huge amounts of computing resources, and artificial-intelligence-based solutions can often provide valuable alternatives for efficiently solving problems in the civil engineering.

Artificial Intelligence generally involves the development of a mathematical model derived from experimental data. In structural mechanics, Transportation / Infrastructure systems, Geotechnical and construction materials contexts, recent experiments have reported that fuzzy logic (FL), artificial neural networks (ANNs), genetic algorithm (GA), Support Vector Machines (SVM) and fuzzy genetic (FG) may offer a promising alternative. They are known as artificial intelligence. In Civil Engineering, AI methods have been extensively used in the fields of civil engineering applications such as construction management, building materials, hydraulics, optimization, geotechnical, structural design with its health monitoring and transportation engineering.

Artificial intelligence has a broad application prospects in the practice of civil engineering. Over the past 20 years, in the civil engineering field, development and application of the expert system have made a lot of achievements, mainly used in project evaluation, diagnosis, decision-making and prediction, building design and optimization, the project management construction technology, road and bridge health detection and some special field, and so forth. Self-diagnosis, multi-objective shape control and reinforcement-learning processes were implemented within a control framework on an active tensegrity structure.

Among artificial intelligence-based computational techniques, adaptive neuro-fuzzy inference systems were particularly suitable for modelling complex systems with known input-output data sets. Such systems can be efficient in modelling nonlinear, complex, and ambiguous behavior of cement-based materials undergoing single, dual, or multiple damage factors of different forms in civil engineering.

According to the research progress above on AI in civil engineering, and due to AI developing rapidly, there are still a lot of improvement measures that can be worked for Indian scenario. In general, the improvement of AI approaches include the change in its components or the use of technology, sensors, Convolutional Neural Networks (CNN, RCNN, Faster RCNN etc.), the hybrid genetic algorithm, the dynamic adaptive technology, using non-standard genetic operators and the parallel genetic algorithm. In recent years, the improvement of the AI introduced many new mathematical tools in civil engineering with the latest analytical methods in applications. We can expect, along with the computer technology, the AI in civil engineering application will be more general and more effective in economizing the projects and to ease its maintenance and operation activities.

AI can infiltrate construction across three categories:

- Examining where AI solutions are beginning to emerge in construction today.
- Exploring AI-powered applications and use cases that have already made an impact in other sectors and that can be applied in the construction industry.
- Assessing additional machine learning algorithms and their potential E&C applications.

2. The Current State of AI in Engineering and Construction

AI usage in construction are still relatively nascent, though a narrow set of start-ups are gaining market traction and attention for their AI-focused approaches. There are a few early-stage examples construction firms can evaluate:

- Project schedule optimizers can consider millions of alternatives for project delivery and continuously enhance overall project planning.
- Image recognition and classification can assess video data collected on work sites to identify unsafe worker behaviour and aggregate this data to inform future training and education priorities.
- Enhanced analytics platforms can collect and analyze data from sensors to understand signals and patterns to deploy real-time solutions, cut costs, prioritize preventative maintenance, and prevent unplanned downtime.

2.1. Transportation route optimization algorithms for project planning optimization

Currently available technology already offers transportation companies, the ability to optimize routes and improve traffic navigation. In the future an AI technique called reinforcement learning, which allows algorithms to learn based on trial and error, could provide even more effective optimization as well as solve for objective functions (e.g. duration or cost of fuel). Such technology could be directly applicable to Engineering & Construction (E&C) project planning and scheduling, as it has the potential to assess endless combinations and alternatives based on similar projects, optimizing the best path and correcting themselves over time.

2.2. Robotics for modular or prefabrication construction and 3-D printing

While use of modularization and 3-D printing is advancing in construction today, there could be a longer-term opportunity to maximize the benefits of these approaches through machine learning. For example, robotics industry researchers have successfully trained robotic arms to move by learning from simulations. In E&C, this application might someday be applied to prefabrication techniques and maintenance operations for oil and gas as well as other industrial sectors.

2.3. Smart Homes and Commercial Buildings

Wireless systems provide much simpler installation as well as the flexibility to relocate or add to a system, compared to installing wired systems. Figure 1 and 2 depict some of the wireless and battery-less system that can be adopted for making life easier and a smarter system adopting to user requirements for both residential and commercial buildings.

Figure 1: Wireless and Battery-less System for Smart Residential Buildings.

Figure 2: Wireless and Battery-less System for Smart Commercial Buildings.

3. Internet of Things (IoT) in Civil Engineering

As the Internet of Things (IoT) era develops, devices become smaller, more accurate and more relevant to a wider range of sectors. There is an opportunity for civil engineering to drive greater operational efficiencies as a result of increased access to real-time data. In fact, we're already witnessing a new age of geotechnical and construction monitoring that allows engineers to analyze projects and existing structures remotely and gather information from a range of assets digitally and in real time. Figure 3 depicts a typical IoT device component structure.

3.1. Data driven devices to enhance productivity and accuracy

Data collection plays a vital and extensive role in construction. From monitoring traffic variation and its pattern, structural health monitoring, monitoring water pressure changes during soil consolidation, settlement during soil reclamation works, to assessing terrain deformation during tunnel construction, being able to accurately record measurements over vast working areas is essential to project success.

Data collection, up until now, has primarily been performed manually, with engineers taking key measurements while out in the field – a method that often impedes productivity. Manual data collection can be inaccurate, complex and time intensive. Engineers not only have to contend with harsh environments and difficult- to-access sites, but there is also the risk that, due to a lack of processing speed, site conditions can change between readings, rendering data unreliable.

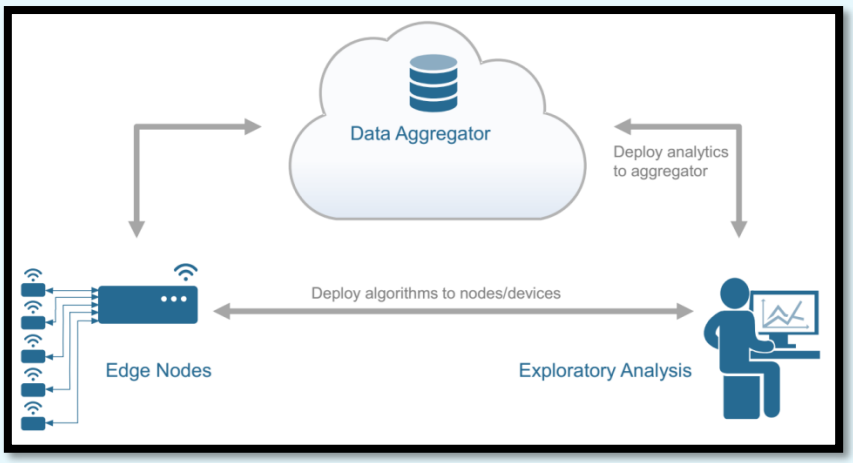


Figure 3: A Typical IoT Device Component Structure.

However, the emergence of the Industrial Internet of Things (IIoT) represents a significant shot in the arm for the civil engineering sector. The deployment of low-energy sensors to monitor an infrastructure's condition and environment allows for a vast range of data to be gathered remotely, before being aggregated and visualized via a secure online dashboard.

3.2. Operational intelligence

While automated processes that allow information to be gathered digitally can greatly reduce manual tasks and associated costs, conversely, the deployment of sensor technology across multiple aspects of a civil engineering project can sometimes result in 'data overload' from an abundance of unconnected data sets.

Implementing an operational intelligence solution centralizes the data; but instead of limiting analysis to merely the visualization of this aggregated information through dashboards, operational intelligence looks to take this one a step further. In other words, organizations that successfully exploit operational intelligence capabilities feed real-time insight into the decision- making process, not only for immediate effect, but also to help develop predictive and preventative maintenance approaches that will ultimately enhance productivity.

3.3 Manual readings eliminated

For civil engineering organizations, the digitization of assets undoubtedly promotes operational efficiency with automated supervision, all but eliminating the need for manual data readings. The implementation of a relevant operational intelligence strategy to analyze and subsequently influence decisions has the potential to improve project performance and productivity. By using data to better control workforces, supplies and structural analysis, civil engineering organizations not only reduce the time and costs associated with projects, they also place themselves in a better position to evaluate risk and pre-plan responses.

References:

Various internet sources are acknowledged

Dr. C. Naveen Kumar holds a PhD degree from IIT Roorkee and a M. Tech degree from NIT Calicut. He has more than 12 years of industrial experience in abroad and India. His research interests include Road Safety Analysis, highway geometric design, traffic impact analysis, transportation planning and Bayesian Statistics.

MY INDUSTRIAL EXPERIENCE AND AREAS OF RESEARCH IN TECHNOLOGY

Dr. Kadali Srinivas
Associate Professor, CED

My professional experience is related to Geotechnical Engineering, Environmental related projects, Sustainable Building Materials, and **Advanced Material Characterization**. I have been closely involved with site investigation, design, construction and remediation associated with geotechnical projects. I was Involved in Technology demonstration of "application of fly ash based zeolites for environmental cleanup projects". I have served industry in developing products like **ceramic proppants**, EPS sandwich panels, AAC blocks, and **synthetic zeolites**. I have also been involved in development of online mobile methodologies for testing of soils and design and construction of low cost houses with in short span.

In this context I would like to share the following demonstrated projects.

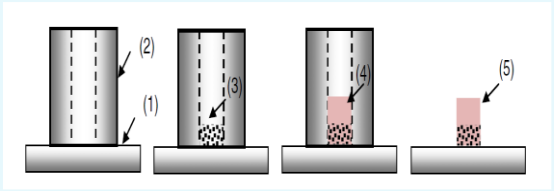
Rejuvenation of contaminated water ponds/Lakes by water softeners and floating bed technology:

Water pollution of ponds and lakes, a global problem, is continuously growing due to indiscriminate and unscientific releases of huge quantities of untreated or partially treated domestic wastewaters and also industrial and agricultural wastes. To over some such issues contaminated water ponds can be treated by water softening agents and floating bed technology, which will enhance the water quality drastically bring down the BOD, COD levels and removes the color, odor, turbidity. Such technology demonstrated project presented below.

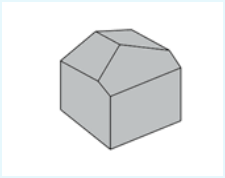
Contaminated Ponds **Spraying of Water softeners** **Floating bed Technology**

Application of Nanoindentation to establish influence of heat on particles (Published in Engineering Geology):

In the scenario of materials processing and infrastructural development, many situations are encountered where materials are subjected to elevated temperatures. This may lead to alteration in the mechanical and engineering characteristics (such as hardness and residual modulus) of the materials. In this context, these characteristics can be quantified by measuring deformation of individual grains exposed to different elevated temperatures, by employing Nanoindentation. An attempt was made to explore the potential of this technique and methodology for holding the grains.

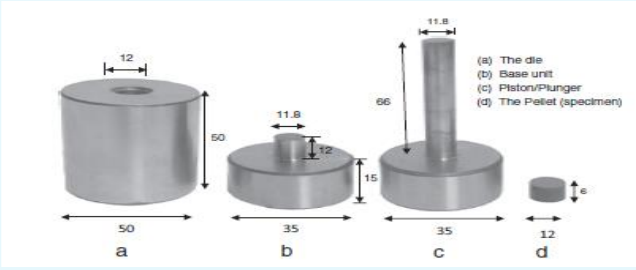


Sample preparation for Coarse grained materials

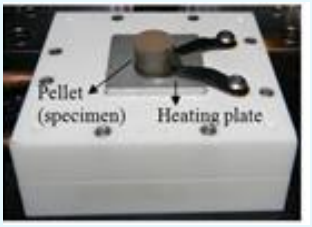


Berkovich indenter

Nano Indentation setup



Sample Preparation for fine grained materials

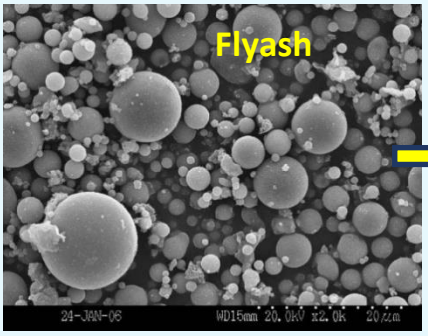


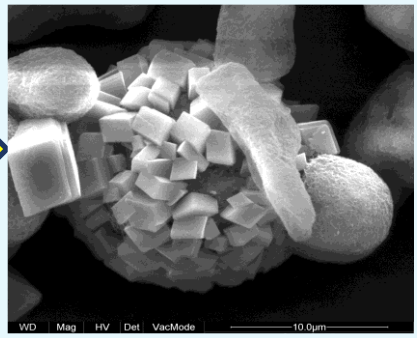
Heating Platform

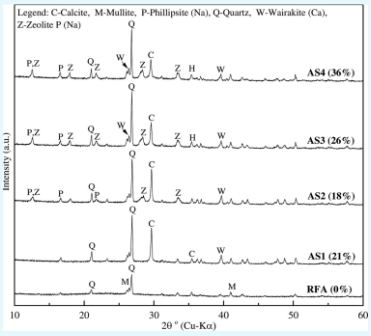
Note: For complete details refer: http://www.researchgate.net/publication/256699982

Flyash to Value added minerals: Published in ASTM – Material Performance & Characterization

The method for alkali activation of fly ash utilizes $Ca(OH)_2$ and NaOH for the formation of pozzolanic material and fly ash zeolites, respectively. Sodium-based fly ash zeolites mostly employ NaOH for activation of fly ash before its application as an absorbent. However, the Na-zeolites as absorbents result in sodicity, which in turn reduces their holding capacity of moisture, nutrient (i.e., NPK fertilizers), microorganisms (viz., microbial spores), or heavy metals and negatively affect the growth of plant and aquatic life. To resolve such problems, the present study is focused on synthesis of agro-grade blend (dominated by Ca-zeolite) of zeolites by using $Ca(OH)_2$ as major alkali and two well-established mineralizers, NaOH and NaCl, used in the trace quantity. To monitor activation of the fly ash in two different conditions, the synthesis of zeolites could be carried out by employing (1) conventional hydrothermal system and (2) autoclaving methods.



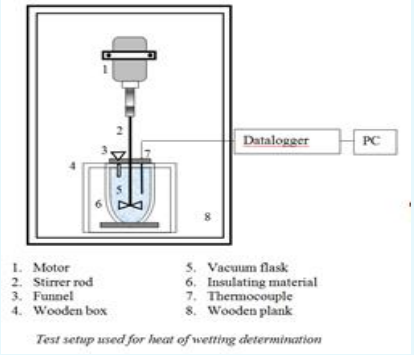




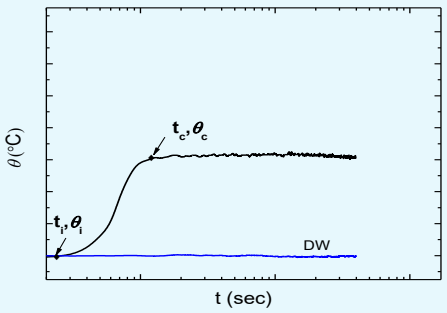
Note: For complete details refer:
https://www.astm.org/DIGITAL_LIBRARY/JOURNALS/MPC/PAGES/MPC20140053.htm

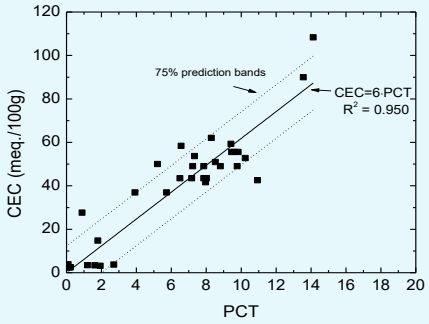
Determination of Soil-Specific Characteristics by Heat of Wetting (Published in ASTM)
(Patented: Method and system for soil Classification):

Conventionally, particle size distribution characteristics and consistency limits have been used to characterize fine-grained soils. However, these schemes of soil characterization are devoid of several other soil-specific parameters (viz., specific surface area, specific gravity, weight loss during heating, heat produced during the interaction of soil with water, chemical and mineralogical composition, zeta potential, cation-exchange capacity, and reactivity) that imbibe in them physical, chemical, mineralogical, and thermal characteristics or, in short, the "overall characteristics" of the soil. These characteristics are also useful to define soils with pollutants and contaminants, which result from rapid and indiscriminate industrialization. Hence, characterization of the soil based on its "heat of wetting," which imbibes the specific characteristics of the soil and is measured by the percentage increase in temperature (PIT) when soil-water interaction occurs, appears to be quite prudent and a novel idea or hypothesis. With this in view and to develop a soil characterization scheme, soils of completely different characteristics were allowed to interact with water in a calorimeter, and the PIT was measured. The PIT and various soil specific parameters when correlated with each other yielded well-defined relationships. Utility of these relationships for a quick and easy characterization of fine-grained soils has also been demonstrated in this study.



Test setup used for heat of wetting determination



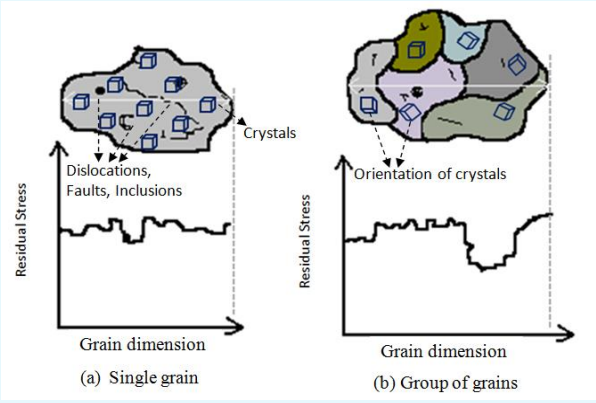


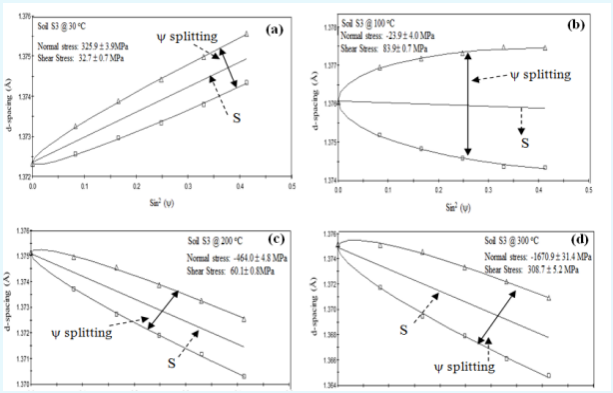
Investigations on Heat of Wetting: (Thermodynamics of soil-water interaction):

Note: For complete details refer:
https://www.astm.org/DIGITAL_LIBRARY/JOURNALS/TESTEVAL/PAGES/JTE20150308.htm

Residual stress analysis on Soil Particles (Published in ASTM – Journal of Testing & Evaluation):
Attempts are made to quantify the mineralogical changes, crystal size, lattice strain, normal stress (tensile and compressive), and shear stress of geo-materials, by X-ray diffraction (XRD) analysis. Such studies would be quite useful in predicting the response and engineering properties of geo-materials at various environmental conditions.

Reuss model: ψ-Tilting Method





Note: For complete details refer:
https://www.astm.org/DIGITAL_LIBRARY/JOURNALS/TESTEVAL/PAGES/JTE20150308.htm

Low cost housing Technology from Flyash based EPS Sandwich panels: As urbanization is rapidly growing the construction of residential area is perpetrating intensely and at the same time the world is also facing the energy resource shortage. Hence there is a need to modify the housing design and construction technologies which are used in the country to reduce the cost, CO_2 emission, and to provide more indoor comfort with least energy needs. There is a need to focus on such materials which along with traditional construction materials that are concrete and steel will satisfy the properties like thermal conductivity, embodied energy, durability, sound insulation, earthquake resistance & strength. The use of expanded polystyrene sheet (EPS) panels which are made from small beads of polystyrene mixed with pentane as the blowing agent are best suitable for our purpose. Attempt had made to review the various aspects of EPS imbedded in the reinforced concrete and its prospective design & implementation in the building to make it energy efficient. EPS panel structure is having a low thermal conductivity as compared to concrete, which helps in reducing the energy consumption.

Dr. Kadali Srinivas, holds a Ph.D. (Geotechnical Eng.) from IIT Bombay, M. Tech (Geotechnical Eng.), from NIT Warangal, and B. Tech (Civil Eng.) from S.V. University. He has worked with various prominent research projects through IIT-Bombay and has been involved in the development of sustainable products. He has published several research papers in reputed journals

ADVANCEMENT OF DRONES IN CONSTRUCTION FIELD

MANJOT SINGH GANDHI
15071A0192

UAV's are the future of construction

The unmanned aerial vehicle (UAV) commonly known as 'Drone' is an aircraft that is without a pilot and is controlled by a ground based controller. Previously only commonly used in the military, we now see them providing footage at sporting events and concerts, and for films and advertisements. They are used in agriculture to monitor crops and animal herds, and in search and rescue for locating missing persons. For civil engineering purposes, drones are equipped with high-definition cameras which have built-in image stabilizers. The better drones can fly close enough to structures such as buildings and bridges to spot signs of wear that could easily be missed by a routine inspection. What's more, drones can fly over an area that might not be easily accessible in any other way, recording visual data as they go. When analyzing this data, construction teams may find obstacles that would have affected their project, and which would never have been detected using conventional methods.

How can drones assist construction practices?

Surveying

Drones mean a quantum leap for surveying. They provide eyes that can reach and hover above specific sites. Their height and cameras can be adjusted remotely. And, equipped with sensors, they can measure, transmit and store data. A use of drone in surveying ensures safety of employees as surveyors work is mostly outdoors exposing them to various unexpected and tough terrains. The survey speed is also increased by using a drone. Unlike conventional method of surveying where multiple tools are required, use of drone will ensure that a single tool serves all the purpose. As a result of all these advantages, the overall budget of the project is bought down.

Drones can survey all kinds of terrains

Site planning

A drone can gather a comprehensive view of a site and compile a 360° panorama perspective of the area. These views reveal assets and challenges, as well as the broad lay of the land. They can also more easily appreciate potential hazards and pitfalls on a particular site. An advantage of drones that is often overlooked is that they can be used to generate live feeds. These can be beamed directly to a control room for certain inspection requirements (e.g. crane clearance, logistics, personnel movement) allowing for real-time decision making, saving time from errors, reducing previously unidentified risks, and improving quality by aiding the decision process.

Drones can be used in site control and planning

Inspections of tall structures

Cameras on drones make it much easier to inspect tall structures. Cranes, scaffoldings, towers, and skyscrapers can all be investigated in real-time, sending live footage of any anomalies to their controllers. Using drone-mounted cameras is a lot faster than sending a team of inspectors up to investigate a structure's integrity. It's safer, too, as the only potential for damage is to the drone itself – and not to a team of rope access personnel. Plus, the footage covers more area and records every square centimetre, making it a lot harder to miss something important.

Logistics planning

Many of our sites are large and change rapidly over a short period. Drones can be used to provide a dynamic visualization; flagging potential impacts and issues that might otherwise be overlooked, e.g. large plant movement and arrangements.

Potential future uses

- The point cloud scanning capabilities of aerial-mounted cameras could provide data which can feed into the BIM model of an ongoing project.
- Volumetric measurements of items on site (e.g. excavated materials) can support the logistical planning needed for the removal of those items.
- Thermal imaging scanning, using thermographic cameras mounted to drones, provides potential opportunities to investigate and monitor the health of concrete works safely.
- Upward filming drones make it possible to inspect overhead structures. This reduces the need for cranes or scaffolding and enhances the safety potential of a project.

References: -

1)https://www.computerworld.com/article/3199631/enterpriseapplications/how-drones-are-advancing-civil-engineering-and-surveying.html

2)https://www.ice.org.uk/news-and-insight/the-civil-engineer/november2015/how-can-drones-transform-construction-processes

3) https://www.slideshare.net/ColinSnow/impact-of-drones-on-civil-engineering

HIGH RISE BUILDING EMERGENCY EVACUATION

ANURAGH VASAM
15071A01B3

1.0 INTRODUCTION

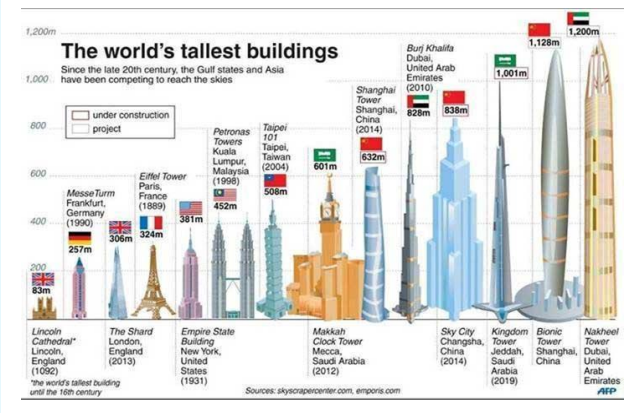
Fire Safety is of prime importance these days. As per National Crime Records Bureau, 20,377 cases of fire incidents were reported in India for the year 2014 which includes 19,513 deaths and 1889 injuries.

The magnitude of fire incidents can be reduced only when the building and structures are designed, constructed, equipped, maintained and operated so as to save life and property of its occupants. The fire at Lotus Business Park building in Andheri (W) on the 18th, July 2014 is one clear example of flouting the fire safety norms. Any structure or building should be erected only after meeting the basic infrastructural requirements needed to protect them from fire and explosion, and even to withstand natural calamities like earthquake, lightening, etc. When it comes to high-rise buildings, the problem becomes more complex and needs meticulous planning.

Fig.1 Fire on Lotus Business Park Building, Mumbai

The term High Rise Buildings is also known as skyscrapers, towers or tall buildings. Fig 2 shows a comparison of 14 tallest buildings in the world.

The **National Fire Protection Association** of USA defines (NFPA 101, Life Safety Code, 2012 edition): "high rise buildings as a building greater than 75 feet (23 m) in height, where the building height is measured from the lowest level of fire department vehicle access to the floor of the highest floor occupiable story". A height of 75 feet translates into roughly seven stories. As per the **International Building Code**: "high rise will be 75 feet to 450 feet" and everything above will be categorized as "Super High Rise". As per the **National Building Code of India** (NBC), 2005, "all buildings 15 m or above in height are high rise buildings". This definition has been followed by all fire statutes brought out in India, except Development Control Regulations issued by few local bodies, who have regarded 24 m as high rise.



There is no comprehensive data available on the number of high-rise buildings existing in India. Cities like Ahmedabad, Bengaluru, Chennai, Delhi, Hyderabad, Kochi, Kolkata, Mumbai, Navi Mumbai and Surat have witnessed vibrant growth of high-rise buildings. Mumbai-Pune regions alone accounts for about 5000 high-rise buildings. The tall buildings have unique features which can adversely affect the fire safety of a building. These features include: height beyond available resources of local fire brigade ladder; extended evacuation time; pronounced stack effect; water supply limitations; mixed occupancies; iconic nature, etc. However, this article will focus only on various methods of evacuation strategies followed and new rescue devices available for safe evacuation of high rise buildings.

2.0 EVACUATION STRATEGIES

In the event of a fire, its occupants need to know what action should be taken to leave the building safely along protected escape route. In very tall buildings, full building evacuation via stairways might be impracticable. Many evacuation strategies have been developed and experimented in various countries and few of them are listed below.

2.1 Total Building Evacuation: Total evacuation involves the evacuation of all building occupants at once from a building to an outside area of refuge or safety. Once the alarm signal is given out, all building occupants are expected to evacuate from the staircases which lead to the ground floor. Although the total evacuation is the simplest strategy to implement, it is usually only ordered by the fire department.

2.2 Progressive Evacuation: In progressive evacuation, occupants can remain in the rescue area for a period before evacuating the building, either by themselves or with assistance from emergency responders or others. Occupants are only evacuated from the building to the exterior as a last resort. The relocation of occupants can either be horizontal – to an adjacent compartment on the same floor or it could be vertically to a dedicated region further down the building from the fire floor i.e., a refuge area/floor. Progressive evacuation might be used for occupants with disabilities.

2.3 Phased Evacuation: In phased evacuation, the occupants on the most critical floors like fire floor and floors nearby will be evacuated first. The occupants within the compartment on fire need to be evacuated from the building immediately. The remaining occupants of the building are evacuated subsequently as necessary. Many high-rise buildings in the world uses phased evacuation in case of fire. Controlled phase evacuation is relatively complex. The concept of phased evacuation relies heavily on sophisticated communication system and training. In phased evacuation queuing time into staircases can be reduced.

2.4 Partial Evacuation: Partial evacuation is also known as "zoned evacuation" or "staged evacuation". It provides for immediate, general evacuation of the areas of the building, nearest the fire incident. A partial evacuation may be appropriate, when the building fire protection features assure that the occupants away from the evacuation zone will be protected from the effects of the fire for a reasonable time. Evacuation of additional zones may be necessary, in the event that a fire or smoke condition exists. In such cases, occupants will evacuate at least two floors below the fire floor, re-enter the zone and wait for instructions.

2.5 Self-Evacuation: Self-evacuation refers to occupants evacuating by themselves, before emergency responders have arrived on site, using available means of evacuation, i.e. elevators and stairs.

2.6 Stay-In-Place Approach: In Stay-in-place, the occupants remaining in the room with an exterior window, a telephone, and a solid or fire resistant door. In case of a fire, when all exits from a floor are blocked, the occupants should go back to their room, close the door and seal the cracks, wave something at the windows and call for help. Stay-in-place evacuation approach is generally used for evacuating the disabled occupants.

3.0 ESCAPE EQUIPMENT: As the vertical heights of the buildings are going up day by day and the evacuation becomes difficult, many new rescue devices are being developed. Some of the new rescue devices tried for high rise evacuation are:

- **Rescue Chutes**: Fire escape chute is an emergency exit that permits rapid, mass evacuation from high-rise buildings during life threatening emergencies. Escape chutes can be used from most high areas, where there is a possibility of being trapped by fire, terrorism, criminal attack, that could result in the event of life or serious injury due to non-availability of alternative means of emergency egress.
- **Suspended Rescue Platform System (SRP)**: A suspended rescue platform system is defined as "an enclosed platform (cabin) or set of enclosed platforms, moving along guides or other means, on the exterior of a building, intended for the evacuation of multiple occupants from a building".
- **Controlled Descent Devices (CDDs)**: The Controlled Descent Devices (CDDs) are escape systems that use a simple harness, cable and breaking device to control the rate of descent. A CDD is an equipment designed to accomplish the withdrawal (emergency egress) of occupants from a building and transporting them from a dangerous area to a safe area.

Rescue Chutes

Controlled Descent Devices

- **Non-Structured Dependent Device:** Non-Structured Dependent Devices are escape systems that do not require contact points with the building or the ground during descent. This can be best described as parachute and the process for escape is similar to base jumping.

OTHER DEVICES USED

1. Evacuation of Mobility Impaired Occupants: There are a variety of conditions that may require an alternative egress plan to be sought, for example, those with temporary disabilities, e.g. broken limbs, sports injuries and pregnancy. An adequate provision for the evacuation of mobility impaired occupants is a fundamental requirement in all buildings – whether tall or not. In tall buildings, special consideration for their protection should be considered. Injured, infants, aged or disabled occupants can now be safely evacuated using special devices such as Evacuation Chairs, Wheelchair Stair Climbers.

2. Helicopter / Rooftop Helipads: In certain cases, helicopters have been successfully used to assist in building evacuations. Many tall buildings are provided with helipads as part of the building's functional use. For example, a hospital or a high end residential/hotel/office.

CONCLUSION In India, every year about 20,000 persons die in fire accidents. Tall buildings have unique features which can adversely affect the fire safety of a building. In every tall building, evacuation via stairways might not be practicable. Thus, many new strategies have been developed for safe evacuation of high rise buildings and amongst them phased evacuation may be more appropriate. Similarly, many new rescue devices are also available. NFPA and ASTM have recognized some of the escape devices as supplemental evacuation devices. The use of such devices may not be recommended as a permanent alternative to the use of stairways or elevators.

REFERENCE

Various internet sources are acknowledged.

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If you have comments or suggestions about our newsletter, please contact us at our email address.
Your feedback and other inquiries are welcome. If you plan to be in Hyderabad, please let us know. We would be happy to personally welcome you back to campus and to the department!

Sincerely,

Prof. Mallika Alapati, Ph.D., FIE, MICI, MISTE

Professor and Head

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“Strive for perfection in everything you do. Take the best that exists and make it better. When it does not exist, design it.”

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