



# ICI UPDATE

An Electronic-Bulletin from the Indian Concrete Institute



## From the President's Desk

Dear ICI Colleagues,

I am glad to meet you all once again through this e-bulletin 'ICI Update'. It is pleasing to note that several centres, where there was not much of activities in the past, have started doing well. I wish every centre is buzzing with lot of activities, which ultimately will get reflected in the growth and prosperity of the institute. More and more colleges are opening ICI student chapters and lot of activities are happening in many student chapters. This is quite evident from the reports received at the HQ on their events. At this point of time, I appeal to all centres to nurture student chapters in their regions and support them in all possible ways, by fulfilling their demands.

As all of you are aware that compliance of GST Regulations is of paramount importance and we had several rounds of serious discussions in the past. All centres have been informed by the HQ on the procedure to be followed.

Necessary documents, for GST registration, by any one of the centres in each State, have already been sent. My earnest request to all centres is to pay serious attention to GST compliance as it is a statutory requirement. I have also requested Chairmen / Chairpersons of all centres to attend the ensuing GC meeting on 21<sup>st</sup> April 2018 at Pune to conclude on GST matters.

We are focussing more on activities of the Technical Committees to bring out more and more technical documents by accelerating their activities and several important decisions will be taken by the GC to improve working of the Technical Committees.

ICI-Chennai Centre is organizing two days International Conference on 'Evolving Trends in Tall Buildings' on 12<sup>th</sup> and 13<sup>th</sup> of July 2018 by joining hands with L&T. Experts from the industry from within India and outside will be

making their presentation. ICI-Chennai Centre has promised to pass on the surplus generated from this event to Technology Centre Building Fund. ICI-Bengaluru Centre is engrossed in preparing for the IWC-2018 in the month of September 2018. ICI-Goa Centre is organizing International Workshop on "National Building Code of India 2016 & Revised Seismic Codes". ICI-New Delhi Centre will be organizing Conference & Exhibition on "Cable Operating Structures (Building & Bridges)" in mid of July, 2018. This is technically very interesting subject. I request all centers to support these mega events by mobilizing delegates and sponsorships.

**Er. Vivek Naik**  
President, ICI

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### Membership Fee

Effective from 1<sup>st</sup> April 2018 the fee structure for Individual Life Membership will be as follows:

1. Below 60 years Rs.9000 + 18% GST
2. Above 60 years Rs.5000 + 18% GST

R. Radhakrishnan  
Secretary General

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## ICI – Kochi Centre

### 1. 7<sup>th</sup> One Day Workshop - Waterproofing Techniques for protecting Concrete Structures

Indian Concrete Institute-Kochi Centre in association with Civil Engineering Department, CUSAT and BASF Pvt Ltd organized the Seventh One Day Workshop on 'Waterproofing Techniques for protecting Concrete Structures' on 24<sup>th</sup> Feb 2018 conducted at Seminar Hall CUSAT. Forty Four delegates including academicians, industrialists, builders and students attended the function. Welcome address and a brief introduction of the speaker was given by Dr. Job Thomas, Professor, Civil Engineering Department, CUSAT, Kochi.

Shri. Ajith T.V. Cluster Manager, BASF Ltd, welcomed the delegates and introduced the Speaker Shri.S.Seshadri.

Shri.S.Seshadri, Consultant BASF – Master Builder Solutions, Bangalore took the following sessions :

1. Importance of water tightness in structure for durability
2. Causes of water leaks / ingress
3. Chemical solution for waterproofing and broad application for each type.

The afternoon session was handled by Er.Mathukutty, Assistant Manager, BASF Ltd – Application Methodologies Training which was supported by BASF Applicators.



Shri. Ajith T.V.



Dignitaries on the Dias



Banner placed outside the venue

Shri.S.Seshadri

Er.Shelly S. Fernandez Managing Director Qcrete Readymix (India) Pvt Ltd distributed certificates to all participants.

Dr.Job Thomas, Associate Professor, CUSAT proposed vote of thanks.

### 2. 2nd-One Day Workshop on 'Non-Destructive Testing of Concrete'

Indian Concrete Institute-Kochi Centre, in association with Rajiv Gandhi Institute of Technology, Kottayam, Qcrete Readymix (India) Pvt Ltd and Bureau Veritas (I) Pvt Ltd organized the 2<sup>nd</sup> One Day Workshop on 'Non- Destructive Testing of Concrete' on 17<sup>th</sup> March 2018 at RIT, Kottayam.



Dr.Dhanya B S



Er.Shelly S Fernandez

Thirty Two delegates including academicians, industrialists, builders and students attended the seminar. Welcome address and a brief introduction of the speakers was given by Dr.Dhanya B.S, Associate Professor, Civil Engineering Department, RIT, Kottayam. Er.Shelly S Fernandez, Managing Director, Qcrete Readymix (India) made a presentation on “Normal and abnormal Failures of Concrete Cubes”. Er.Beena Kumari K., Manager, Bureau Veritas (I) made a presentation on “ Non-Destructive Test-Core Test” and Dr.Dhanya B.S., Associate Professor made a presentation on “Non-Destructive Test-UPV Test, Rebound Hammer test and Cover Meter”.



Er.Beena Kumari

The afternoon session was handled by Dr.Dhanya B.S., covering the practical aspects of Non-Destructive Tests. She also distributed certificates to all participants and proposed vote of thanks.



Participants having hands on experience on Non-Destructive Equipments.

M/s.Qcrete Readymix (India) Pvt Ltd had made all arrangements for the function.

## ICI-Lucknow Centre

### 1. RMC Plant Visit

Indian Concrete Institute, Lucknow Centre in association with UltraTech Cement organised a “Ready Mix Concrete Plant Visit” for the students of IIT, Kanpur on 16<sup>th</sup> February 2018 at UltraTech RMC Plant at Lucknow.

IIT, Kanpur has its ICI Student Chapter. Er.Pradip Kumar Jha (Honorary Secretary, ICI-Lucknow Centre & Regional Head-Technical Services, UltraTech Cement) coordinated with all the concerned for this plant visit. Er.Sanjay Singh (Executive Council Member, ICI-Lucknow Centre & Plant Head), gave an overall perspective of RMC & its relevance in today's context. The team of UltraTech RMC, Lucknow and local technical team of UltraTech Cement were instrumental in making this happen.

The students were briefed on QC measures while selecting raw materials for RMC, detailed production process of RMC, and QC measures of finished product. 16 students from IIT, Kanpur visited the RMC Plant.



### 2. Technical Lecture on “Intelligent Urban Transport Solutions-Metro Rails”

Indian concrete Institute, Lucknow Centre, in association with UltraTech Cement Limited organised a technical evening on Intelligent Urban Transport Solutions-Metro Rails. Er.Kumar Keshav, Managing Director, Lucknow Metro Rail Corporation was the keynote speaker. Dr.Sudhir Misra, Chairman, ICI, Lucknow centre welcomed the technocrats from Lucknow and adjoining areas and shared the role of the Institute towards the quality constructions in building the nation. Prof.A.K.Tiwari (Past Vice President, ICI-North and Vice President, UltraTech Cement) welcomed the Chief Guest and Keynote speaker of the evening Er.Kumar Keshav with a memento.



Dignitaries on the Dias



Dignitaries on the Dias

Er.Kumar Keshav, made an insightful presentation on “Intelligent Urban Transport Solutions-Metro Rails”. He briefed on the need of Metro Rails especially in Metros and Mega Urban cities with population of 1 million and above. He briefed on the challenges in constructing Metro Rails and the new technologies that have entered in making of such Metro Rail Projects. He laid emphasis on Sustainability, Environment friendliness, resource optimisation etc. He also threw insights on the accomplishments of Lucknow Metro vis-à-vis other Metro projects in India. Er.Kumar Keshav highlighted on various

customer engagement initiatives taken by Lucknow Metro to establish a connection with the local citizens and commuters. He detailed the role of metro rails in building intelligent urban transport networks across the world in general and India in particular. He shared the journey of metro rails in India and informed that now-a-days almost every city is looking for metro as solution to their transportation within cities. He detailed various innovations being undertaken by LMRC and other corporations, improving the quality of life of citizens.

Shri.Balachandra Nair presented Vote of Thanks.



Participants

Er.Ashok Kumar Singh, Vice-Chairman, ICI-LC, Shri.Rakesh Balya, ZHM, UltraTech, Er.Pradip Jha, Hon.Secretary ICI-LC, Shri.Sunil Banka, Treasurer ICI-LC were also present.

More than 135 participants mainly practicing engineers, architects, government engineers, academicians, consultants etc were present in the seminar.

## TRAINING HALL

A/C Training Hall with audio visual aids, to accommodate 30 trainees, is available for Rs.10,500/- per day for rent, at our Technology Centre at Ten Square Mall, No.201, 1st Floor, Jawaharlal Nehru Road, Koyambedu, Chennai 600 107 close to CMBT. For your requirements, pl. contact : 044-24792602, 24795148, Email : [ici4@airtelmail.in](mailto:ici4@airtelmail.in)

## ICI - Mumbai Centre

### 1. One day Seminar on 'Learning from Construction Failures'



Indian Concrete Institute (ICI) Mumbai Centre, jointly with the Institution of Engineers (India)-Maharashtra state centre organised a one day seminar on "Learning from Construction Failures" at Mumbai on 9<sup>th</sup> January, 2018.

The aim of the seminar was to focus on case studies relating to failures due to design, safety, materials, methodology, machinery/equipments etc. There are several challenges in construction of concrete structures on account of various constraints in working conditions, paucity of skilled labour, execution complexities etc which may lead to failure of structures. These may be on account of methods adopted in structural design, material selection; construction practices equipments or techniques deployed. The seminar was aimed to deliberate on many such aspects, challenges & case studies where complex situations arose, causing failure. The seminar also focussed on engineered solutions applied to restore the structures where there was an opportunity.

Total 3 technical sessions were conducted consisting of 9 speakers on various interesting topics related to Learning from construction failures. Around 150 delegates attended the programme.

Er.Ashwin Moghe, Chairman, ICI-Mumbai Centre welcomed the delegates and dignitaries and introduced the theme of the seminar and its importance to practicing professionals. He also briefed about the Mumbai Centre activities to the audience. Er.Manoj Kawalkar, VP (West) ICI explained the ICI activities in west zone. Er.Vivek Naik, President, ICI was the guest of honour for this seminar and addressed the audience on importance of the seminar topic and role of ICI in educating concrete professionals on various topics in the field of construction & concrete technology. Secretary General – ICI, Er.R.Radhakrshnan had

also graced the occasion. Dr.H.M.Raje, Hon. Secretary of ICI, Mumbai centre gave Vote of thanks.

Dr.N.V.Naik, Er.Samir Surlaker & Chairmen of ICI-Raipur, Bangalore, Kolkata & other GC members were also present. Programme was conducted by Er.Sunny Surlaker.



Lighting of Lamp



Er. Vivek Naik



Er.H Subbarao



Er.Chetan Raikar



Er. Vinay Gupta

## 2. Technical Lecture on 'Improving Aesthetics of Cities with Architectural Concrete'



Indian Concrete Institute (ICI) Mumbai Centre, jointly with the Ready Mixed Concrete Manufacturers' Association (RMCMA) and Structural Engineering Department of Veermata Jijabai Technological Institute (VJTI), Mumbai organised an evening meeting on "Improving Aesthetics of Cities with Architectural Concrete" at VJTI, Mumbai on February 28, 2018. The objective of the meeting was to create awareness amongst the engineering and architectural fraternity to utilize the aesthetic potential of concrete better, while simultaneously fulfilling the structural and design requirements. The program was sponsored by Rishika Enterprises, Nagpur.

Mr. Vijay Kulkarni, Principal Consultant, Ready Mixed Concrete Manufacturers' Association (RMCMA) introduced the theme and discussed how the concrete has evolved over the last few decades offering unlimited scope to architects and designers to stretch their imagination to provide newer and better ideas to more and more aesthetically beautiful structures.



Dr. Deepali Hadker, Director, Sterling Engineering Consultancy Pvt Ltd, Mumbai as the Keynote speaker, highlighted the need of using architectural concrete with many examples. Dr. Hadker presented few case studies. Her detailed presentation on the TCS's Banyan Park buildings was remarkable. She explained how the network of raised, shaded passageways, provide refuge from Mumbai's intense heat and seasonal monsoons, The Banyan Park architecture



Speakers at the event: Dr. Deepali Hadker, Ms. Rupali Bharambe and Mr. Vijay Kulkarni



A view of the invitees at the event

is such hallways remain outdoor spaces and they are connected by generous exterior stairways, encouraging people to move from floor to floor on foot. Breakout spaces are incorporated into the hallways, allowing people to interact with views of the verdant landscape. Dr Hadkar explained how such planning approach greatly reduced the building's cooling demands and energy usage by limiting the conditioned space to the areas where it is required

Ms. Rupali Bharambe, Proprietor, Rishika Enterprises, Nagpur presented the details of practicing stamp concrete constructions. Stamped Concrete is the process of adding texture and colour to concrete to make it resemble like stone, brick, slate, cobblestone and many other products found in nature including wood, fossils, shells and many more. "This limitless array of possibilities combined with great durability and lower cost than natural products makes Stamped Concrete an easy choice for new construction and renovation projects" said Rupali. She presented case studies on stamp concrete projects.

Among the invitees were about 120 professionals from Indian Concrete Institute (ICI), Ready Mixed Concrete Manufacturers' Association (RMCMA) member companies and their customers, Architects, Engineers from Greater Mumbai Municipal Corporation (MCGM) and neighbouring cities of Thane and Navi Mumbai, Mumbai Metro Rail corporation limited, Public Works Departments, and Central Public Works Department, Faculty and Students of the VJTI.

## ICI - Nagpur Centre

### 1. Inauguration of ICI-Nagpur Centre's Technology Center

It was a moment of pride & jubilation for Indian Concrete Institute-Nagpur Centre that its dream of having its own Office-Cum-Technology Centre has become reality on 15<sup>th</sup> of March 2018.

The Technology Center is located at the first floor of Building named "Irawati" in front of Somalwar High School, Nikhalas Branch, Deendayal Nagar, Nagpur.



Er.P.S.Patankar, Chairman, Er.Milind Khamgaonkar, Secretary, Dr.Virendra Dehadri, Treasurer, ICI-Nagpur Centre and Er.Ashish Dwivedi welcomed the dignitaries by offering bouquets. Er.K.C.Tayade, Dr.Anant Pande, Dr.Rohit Mane, Er.Kishor Mehata, Dr.Dilip Mase, Dr.Arun Pofale, Dr.Shirkhedkar, Er.Ish Jain and Er.Raipure were present amongst other prominent Members.



Indian Concrete Institute - Nagpur Centre's "Technology Center" was inaugurated on 15<sup>th</sup> of March 2018 by the hands of Er.Vinay Gupta, President (Elect), Indian Concrete Institute. The function was graced by the presence of Dr.Manamohan Kalgal, Technical Advisor, UltraTech Cement Ltd & Immediate Past President ICI, Er.R.Radhakrishnan, Secretary General, ICI, Dr.V.Ramachandra, Director, Technical, Ultratech Cement Ltd and Er.Manoj Kawalkar Vice-President-West ICI. The inspiration behind this centre, Er.Vivek Naik, President ICI could not attend the programme due to personal reasons.



Eminent dignitaries from Construction Industry, Technocrats & Academic fraternity, attended the function.

## 2. "ICI-UTCL AWARD- 2017"

ICI Nagpur Centre in association with Ultratech Cement Ltd organised ICI (Nagpur)-Ultra Tech Award Ceremony for outstanding Concrete Structures of Vidarbha-2017 at Nagpur on 15<sup>th</sup> March 2018. Eminent personalities present on the dais were Er.Vinay Gupta, President (Elect) ICI, Guest Speaker Dr.Manamohan Kalgal Technical Advisor, UltraTech Cement Ltd & Immediate Past President ICI, Er.R.Radhakrishnan, Secretary General ICI, Dr.V.Ramachandra, Director Technical, Ultratech Cement Ltd and Er.Manoj Kawalkar, Vice-President (West) ICI, Er.P.S.Patankar, Chairman, ICI-Nagpur Centre welcomed the delegates & informed about background of various categories of award for Outstanding Concrete Structures of Vidarbha-2017. He also informed the gathering regarding inauguration of own office of Nagpur ICI Centre on the same day.



Guest Speaker Dr.Manamohan Kalgal in his speech explained about scarcity and environmental concerns pertaining to river sand and spoke on the manufacture of crushed sand elaborating on the technical and quality aspects in manufacturing. He also touched upon the other alternatives briefly to achieve sustainable development.



The awards in various categories were distributed by the hands of dignitaries. The categories are : 1.Residential Bungalow; 2.Residential-Flat scheme; 3.Commercial/Public Building; 4.Jury Special Award.







President of the function, Er.Vinay Gupta spoke on the present scenario & future prospect for alternative to river sand in construction industry.

Er.YTVV Prasad Vice President Technical Services UltraTech Cement Ltd Mumbai elaborated the various quality products from UltraTech Cement Ltd.

The programme was concluded by the vote of thanks proposed by Er.Milind Khamgaonkar, Secretary, ICI-Nagpur Centre.

Dr.Sandeep Shirkhedkar, the master of ceremony anchored the programme very nicely and lively.

Eminent dignitaries from Construction Industry, Technocrats and Academic fraternity attended the gathering.

### 3. Technical Lecture on Manufacturing of Aggregates and Crushed Sand by Er. V.M. Galande

ICI-Nagpur Centre in coordination with Ambuja Knowledge Center Nagpur arranged a Technical Lecture on 'Manufacturing of Aggregates and Crushed Sand' by Er.V.M.Galande, Past President, ICI-Nagpur Centre on 17<sup>th</sup> March 2018.

Er.V.M.Galande in his expert lecture emphasised that increasing construction activities in modern economy led to sand scarcity along with



environmental concerns. An Alternative-Crushed Sand is a substitute river sand for construction purposes and is produced from hard stone by crushing.

He stressed on quality of source materials with suitable strength and shape characteristics of aggregates produced. He detailed on quality production of Coarse and fine Aggregate & precautions to be taken at each step, viz., crushing, screening and washing. Separation into discrete fractions, recombining and blending may be necessary, he added.



Er.Milind Khamgaonkar, Secretary, ICI-Nagpur Centre welcomed the dignitaries.

Er.Madhumari Nanwani from Ambuja Cement anchored the programme well. Eminent dignitaries from Construction Industry, Technocrats & Academic fraternity attended the gathering.

#### 4. Technical Visit to “Madhav Netralaya” Indian Green Building Council (IGBC) Platinum rated green building in Central India.

Indian Concrete Institute-Nagpur Centre, the Indian Green Building Council, Associations of Licensed Engineers and Association of Consulting Civil Engineers had jointly planned a technical visit to recently inaugurated “Madhav Netralaya, City Center, Samaj Bhushan Society, on 27<sup>th</sup> of March 2018.

The Madhav Netralaya City Center has achieved the rare recognition of becoming the first I.G.B.C. Platinum rated green building in Central India and the First Platinum rated Eye hospital in India. The building has been rated as per I.G.B.C. healthcare Green rating system.

Ar.Rajendra Dongre who is Architect of this project gave detailed technical information about planning and green building design. Er.Hitesh from Technodeal explained about documentation procedure for IGBC.



Er.Sumanta Mundle and Er.Warnekar of integrity construction, builders conducted the program.

Er.P.S.Patankar, Chairman & Er.Milind Khamgaonkar Secretary, ICI, Nagpur Centre,



Dr.Andhare, Mr.Sameer Bendre, Er.Pathak from Management Committee, Ar.Ashok Mokha, IGBC Chairman, Ar.Prashant Satpute, Ar.Amit Pimple, Dr.Rohit Mane and Er.Kishor Mehata were prominently present.

### ICI - Pune Centre

#### Workshop on “Formwork Design & Failure Analysis”

ICI-Pune Centre conducted a Workshop on “Formwork Design & Failure Analysis” on 24<sup>th</sup> March 2018. Er.Vijay Ghugare, eminent Formwork Designer was the speaker. He emphasized on proper load calculations and the correct design for formwork to avoid failures. This was explained through photographs and videos.

The session was very interactive and participants demanded more such workshops in future on various topics of importance. Earlier, Mr.Jayant Khode, Leader for Technical Programme Committee of ICI, welcomed all & introduced the speaker.



## ICI Annual Awards 2018

**Nominations are invited for the following awards :**

01. ICI - Outstanding Concrete Structure
02. ICI - Outstanding Prestressed Concrete Structure
03. ICI - Young Scientist
04. ICI - Innovative Application of Special Concretes
05. ICI - Best Ph.D Thesis in Concrete
06. ICI - Dr.A.Ramakrishna Award for the Best Project with Precast Concrete in India
07. ICI - Best Students Chapter
08. ICI - Best Centre

For details, pl. mail to  
ici4@airtelmail.in or call us at 044-24792602

**Last date for receipt : 30<sup>th</sup> June, 2018**

R.Radhakrishnan  
Secretary General

### Training Program on 'Fundamentals of Civil Engineering'

From April 4<sup>th</sup> to 6<sup>th</sup>, 2018, Indian Concrete Institute hosted a 3-day training program titled Fundamentals of Civil Engineering at Amal Jyothi College of Engineering, Kanjirappally, Kottayam. The workshop was to bridge the gap between industry practices and academics syllabus in the areas of concrete mix proportion, design, detailing of structures, project scheduling and setting-out of building structures.

The first day began with an inaugural meeting where Head of the Department of civil engineering Sr. Claramma Rosary lighted the lamp followed by the staff coordinator Mr. Deepak John Peter and student coordinators Ebin Tom and Soumya.

The keynote speech was delivered by Mr. Anzim K.P, M.Tech student about how the 3-day training is valuable.



Keynote speech by Mr. Anzim K.P.

The lecture section started with familiarizing structural drawings by Er. Binu M Issac, Alaya Consultancy, Kottayam. He detailed about Kerala Municipality Building Rules followed by basic things to be practiced during the preparation of structural drawings to be submitted to get building permit.



Section on familiarizing structural drawings by Er. Binu M Issac

The next session was on concrete mix design and proportioning by Er. Renjith. N, Ultratech Cements. The basic steps were discussed and M50 Mix design calculations and proportioning was done during the session.



Section handled by experts of Ultratech cements

The next day started with valuation and estimation of a building by Er. Binu M Issac, which was an interactive session. The estimation of a building was taken by long wall short wall and centre line method. A CAD drawing was given to do detailed estimation by the participants. The schedule of rates session was taken by Er. Jaison Joseph. He gave a detailed presentation on the materials and labour required for a M20 Mix of 10 m<sup>3</sup> and the rates assigned for each material and labour.



Session on Schedule of rates by Er. Jaison Joseph

Afternoon session was a field work of how to set out a plan in site using Total Station. The basic knowledge to operate a Total Station and its working was explained by Mr. M.V. Varkey and Mr. Anishmon Jose. A small site was taken and area was determined using total station.



Determining area using total station (Quick Survey) inside the campus

The last day session started with a design of sunshade, two-way slab and one-way slab with the help of Er.Prince Mathew, P&P Associates, Changanashery.



Session handled by Er.Prince Mathew

Detailing of stairs, strip footing, etc. were discussed during this session. Participants interacted with the expert on the complexity of design, which was explained through reinforcement detailing.

Last session was on project planning and implementation by Er.Oomen Mathew. He explained about project scheduling, planning stages and implementation. The session covered cost benefit analysis with live examples.



Session on Project planning and implementation by Er. Oomen Mathew

The workshop was informative and interactive and the students were immensely benefited.

**Dr.Prakash Chand Jain ICI Member / Scientist DRDO wins Indian Science Congress Homi J. Bhabha Award**



Dr.Prakash Chand Jain (Right) receives Honour from Union Minister of Science & Technology Dr.Harsh Vardhan (Left)

Dr.Prakash Chand Jain, Member Indian Concrete Institute and a Scientist with Defence Research & Development Laboratory (DRDL) Hyderabad has been conferred prestigious Homi J. Bhabha Award by Honourable Minister of Science & Technology, Government of India, Dr.Harsh Vardhan during inaugural Session of 105<sup>th</sup> Indian Science Congress in recognition of his marvellous contributions in the area of Science and Technology ICI Congratulates him.

**Bishop Jerome Institute, Kollam**

**ICI Student Chapter Inaugural Ceremony**

Student Chapter of Indian Concrete Institute was inaugurated at Bishop Jerome Institute, Kollam on 9<sup>th</sup> March 2018 along with the Civil Engineering Association programme "Erectus 2018". 79 Civil Engineering students from second and third year together with four faculty members had enrolled as members of ICI Student Chapter.

Prof.Gouri Mohan L (Vice-Principal & HOD, Department of Civil Engineering) presided over the function. She described the importance of professional bodies like ICI and how they are beneficial to the students. She motivated everyone to actively participate in these professional bodies to get benefited. The inaugural ceremony



commenced with the lighting of lamp by a group of dignitaries viz., Er.Velapgy Madhu Mohan (Chairman, ICI, TVMC), Er.Anwar Hussain (Secretary, ICI, TVMC), Prof.Stephen Joseph Nigli

(Registrar), Prof.Gouri Mohan L, and Dr.Roshan Kumar D (HOD, Department of Mechanical Engineering) and student representatives Thahzeen Sulthana (Association Chairman) and Haida Madonna Harrison (Association Secretary).

The inaugural address by Er.Madhu Mohan emphasized on the wide range of opportunities ICI offers for students, that includes education, trainings, aid for paper publications and lot more a young engineer can expect for enriching his/her professional skill for a bright future.

After the inaugural session, a technical talk made by the distinguished guest Er.Madhu Mohan brought a simplified understanding for the students on how a stable structure is being designed.

The students also got the opportunity to listen to different practical cases that exhibited the true engineering spirit and application of technical knowledge on repair and rehabilitation of structures, from the talk by Er.Anwar Hussain. He also highlighted on quality of materials and supervision of work by engineers to maintain quality standards in construction.

## City Engineering College, Bengaluru

### Inauguration of ICI Student Chapter

The Inauguration of ICI student Chapter was held on 17<sup>th</sup> February 2018. The Chief Guest for the function was Er.M.Ravishankar, Chairman ICI (BC). The inaugural function started with prayer by Mrs.Sindhushree, Associate Professor and followed by lighting of lamp. Dr.H.N.Thippeswamy, Prof. & Head welcomed the gathering. Dr.Rajashekar, Vice-Principal distributed the membership certificates to the students and expressed his willingness to become member of ICI in his speech. Prof.M.C.Maheshkumar, Associate Professor introduced the Chief Guest. The Chief Guest Er.Ravishankar informed the students about ICI



and asked the students to make best use of the facilities. Dr.Sujatha K, Principal, presided over the function and appreciated ICI's contribution. Mr.Suresh N, Co-ordinator of ICI Student Chapter gave vote of thanks.

Dr.Radhakrishna, Secretary, ICI (BC) gave a Technical talk on "Development of Sustainability of Masonry Block", after the inaugural function.



## Hindustan Institute of Technology And Science, Padur

### Workshop on Special Concretes

The Department of Civil Engineering, Hindustan Institute of Technology and Science, Padur conducted a one-day workshop on "Special Concretes" on 7<sup>th</sup> March 2018 under the auspices of the Students Chapter of ICI. The workshop was organized by Dr.Jessy Rooby, Head of the Department, Civil Engineering with co-ordinators Ms.E.Vinodhini and Mr.L.V.Umashankar, Assistant Professors of the Department of Civil Engineering.

Mr.S.Ramakrishnan, Manager of Bekaert Mukund Industries Pvt. Ltd delivered a lecture on Special Concrete in the forenoon session.

The participants were thoroughly engrossed in his presentation which covered the history, development and types of concrete. He also explained in detail about ultra-high performance concrete, self-compacting concrete, decorative concrete and high early strength concrete among others. The talk was made all the more interesting and useful as he shared some of his vast knowledge and industry experience, including some of the projects he had worked on. Mr.Ramakrishnan also touched upon some of the more unique types of concretes like pervious and foam concrete, translucent concrete, self-healing concrete, to name a few. The session was very interactive with students and staff posing queries regarding the mix design and strength of concrete. Mr.Ramakrishnan concluded his talk by encouraging the future engineers to be proud of their choice of profession and reminded them of the importance of maintaining ethics in their work.

The afternoon session saw a brief lecture by Mr.Ravikumar, Associate Professor of the Department of Civil Engineering who took the participants step by step through the mix design, providing them with references and encouraging them to develop a mix design for M40 concrete. The participants then assembled at the Concrete Laboratory and the teams got busy batching the ingredients and preparing the concrete mix.





Feedback was received from the participants who, being aware of the importance of concrete mix design, listened with rap attention to the talks and were excited about the hands-on experience. The workshop ended with a cube casting competition based on their mix designs. The students were awarded with a certificate of merit.

## S.A. Engineering College, Thiruverkadu, Chennai

### 1. Guest lecture on “Flow Measurements and its Importance in Water Resource Engineering”

The 'Department of Civil Engineering' in association with 'ICI students chapter' organized the guest lecture on “Flow Measurements and its Importance in Water Resources in Engineering” on 5<sup>th</sup> January 2018 for the students of II year. The Head of the Department Dr.A.Chandran felicitated the Resource Person Dr.E.Arunbabu, Assistant professor, Centre for Water Resources, Anna University, Chennai with a memento.

The guest lecture was arranged for discussing the hydraulic engineering problems during natural calamities. He gave a vivid lecture on improvising the methods to discharge the water from the existing systems without affecting the environment and also elaborated on several practical problems connected with Poondi reservoir, Adyar basin and Chembarambakkam Lake.

He also explained about the importance of flow measurements with varying conditions such as open channel flow and closed channel flow with basic fundamental equation for arriving the

discharge and specific energy of water. The session was informative to the students to carry out their project work on Water Resources Engineering. He mentioned about the importance in conservation of water and water supply and new wastewater treatment facilities, which in turn helps in minimizing water pollution and health hazards. The program ended up with vote of thanks by Mrs.





## 2. Guest lecture on “Waste Water Treatment Techniques”

The 'Department of Civil Engineering' in association with 'ICI students' chapter' organized the guest lecture on “Waste Water Treatment Techniques” on 22<sup>nd</sup> January 2018 for the students of III year. The Head of the Department Dr.A.Chandran felicitated the Resource Person Mr.A.Pandian, Resident Engineer & Plant Manager, VA Tech Wabag Limited, Chennai with a memento.

The session was arranged for discussing about the collection of waste water from different sources and further treatment through modified technologies. He also elaborated about the different stages of waste water treatment process right from the initial stage such as screening and filtration which is undergoing in treatment plant. At a global level, around 80% of wastewater produced is discharged into the environment untreated, causing widespread water pollution, He added. There are numerous processes that can be used to clean up waste waters depending on the type and extent of contamination. He described the treatment processes in the plant which include physical, chemical and biological treatment.

He also explained about the importance of conservation of waste water for domestic purposes like gardening and agricultural purposes. The session was informative to the students to learn more on waste water treatment. The program ended up with vote of thanks by Mrs.D.Hemalatha, Assistant Professor.

## 3. Guest lecture on “Yield Line Theory”

The 'Department of Civil Engineering' in association with 'ICI students chapter' organized the guest lecture on “Yield Line Theory” on 23.01.2018 for the students of III year. The Head of the Department Dr.A.Chandran felicitated the Resource Person Dr.K.Chinnaraju, Associate Professor, Division of Structural Engineering, Anna University, Chennai with a memento.

The guest lecture was arranged for discussing the uses of yield line theory and to investigate failure mechanisms at the ultimate limit state. He cited examples and case studies, bringing together theory and practice.

The session was informative to the students to carry out their research work on yield line theory rather than elastic methods.

The program ended up with vote of thanks by Mrs.D.Hemalatha, Assistant Professor.

## Sam Higginbottom University of Agriculture, Technology and Sciences, Allahabad

### 1. 5 Days : Hands on Training of Total Station and GIS

The ICI Students' Chapter of Sam Higginbottom University of Agriculture, Technology and Sciences, organized a 5 days project based training program on “Hands on Training of Total Station and GIS” from 6<sup>th</sup> November to 10<sup>th</sup> November 2017 in the college premises for civil engineering students. This training program was managed by faculty co-ordinators – Er.N.N.Harry, Er.Y.K.Kushwaha, Er.Ashhad Imam, Dr.Shakti Suryavanshi, Er.Akash Agarwal, Er.Keshav Kumar Sharma and ICI-SHUATS students chapter core committee.

Dr.Y.K.Bind, Head, Civil Engineering Department, SHUATS welcomed the gathering. Er.C.B.Gupta welcomed Chief Guest Prof.Dr.S.K.Duggal, Chairman, ICI-Allahabad Centre, Professor of MNNIT Allahabad and Dr.Vikas Srivastava welcomed Prof.Dr.W.Jeberson, Head, Dept. of Computer Science & Information Technology,

SHUATS who both graced the function as Chief Guests. On the first day First technical session on “Introduction to total station and GIS” was handled by Dr.Y.K.Bind.

Second Technical Lecture was by Dr.Nekram Rawal, Asst. Prof., MNNIT Allahabad on “Surveying Methodology and Co-Ordinate System”. 3 day project based practical session on total station was supervised by Surveyor Mahesh Kumar from Om engineers . On the last day, third technical session was by Mr.Mukesh Kumar, Asst. Prof. and Dr. Shakti Suryawanshi, Asst. Prof. SHUATS Allahabad spoke on the topic “Introduction to Remote Sensing and GIS”

The valedictory session of the workshop was presided over by Dr.Deepak Lal, Dean SIET, SHUATS. Appreciation prize was given to outstanding participants and volunteers. Dr.Shakti Suryavanshi proposed vote of thanks.

**Event Pictures**



**2. Guest lecture on "Sustainable alternatives to river sand for concrete"**

ICI-SHUATS Students Chapter organized a Guest lecture on the topic "Sustainable Alternatives to River Sand for Concrete" on 15<sup>th</sup> November 2017 in SIET Conference Hall which was sponsored by Ultra Tech Cement, Prayag region. The objective of the lecture was to provide forum for exchange of knowledge and information in relation to latest advancement in concrete.

Dr.Y.K.Bind, HOD of Department Civil Engineering began the Inaugural session and welcomed the

Chief Guest Prof.Ashok Kumar Tiwari, Vice-President Technical, Ultratech Cement Pvt. Ltd.

Prof.Ashok Kumar Tiwari explained about the unavailability of river sand in Uttar Pradesh, over exploitation of natural resources, utilization of industrial waste in construction, and manufactured sand as alternative to river sand for concrete.

80 ICI-SHUATS student members along with the by faculty Dr.Vikas Srivastava, Er.Ashhad Imam, Er.Alvin Harrison, Er.Atul, and Dr.Keshav Sharma, attended the lecture. Dr.Vikas Srivastava welcomed the gathering and Er.Ashhad Imam proposed vote of thanks.

**Glimpses of event**



### 3. Tech Quiz - "The Ultimate Concrete Quiz"

ICI-SHUATS Students Chapter organized a Technical quiz competition related to concrete titled "The Ultimate Concrete Quiz" "on 23rd March 2018 at Shepherd Institute of Engineering and Technology. The objective of the quiz was to impart knowledge on concrete and lab testing of concrete. This quiz competition was organized in two groups. First group was for first and second year students and second group was for third and fourth year students and the winners of First group were M/s.Sarthak Mishra, Sameer Shekhar and Kartikey Pandey and winners of Second group were M/s.Niru Kumari, Richard M. G. Momin and Elizabeth V Lotha.



## Samskruti College of Engg & Technology, Kondapur, Telangana

### 1. Industrial Visit (2017-18)

The civil engineering department organized an Industrial visit under the auspices of Indian Concrete Institute (ICI) student chapter on 27<sup>th</sup> January, 2018 to "Hyderabad Metropolitan Water Supply & Sewerage Board" Mallaram Campus.

A group of III & IV year students accompanied by staff members B.Nagendra babu, B.Lavanya, under the guidance of Head of the Department Dr.Selin Ravi Kumar of Civil Engineering Department visited the Water Treatment Plant.

The main objectives of the visit was to:

- Provide students an exposure from academic point of view.
- Let students learn things practically through interaction with industry.
- Make students aware of advanced technologies in civil engineering.

The students were divided into groups and each group was lead by staff members of the company



III & IV year Students with staff members Water treatment plant

It is rightly said that "See & know' is better than 'read & learn'. Students got a real feel of plant's working after this visit.



## 2. Guest Lecture (2017-18)

Civil Engineering department organized a Guest lecture under the auspices of Indian Concrete Institute (ICI) student chapter on 4<sup>th</sup> Feb, 2018 at “Samskruti Seminar Hall”

Prof.Dr.C.Selin Ravikumar, HOD, Civil Engineering introduced the Chief Guest and explained about the importance of the Guest Lectures.

Prof.Dr.Dharga Kumar, Professor at JNTU Hyderabad delivered a lecture on 'The Modern Geotechnical Trends in Civil Engineering' and explained about the soil stability in various site conditions. He also elaborated on the job opportunities in Civil Engineering. He also visited the labs and explained the field tests to the students. The students and faculty members of SMSK had an interactive session with the Guest Speaker.



## 3. Site Visit on 24<sup>th</sup> March 2018

The Civil Engineering Department organized an Industrial visit under the auspices Indian Concrete Institute (ICI) student chapter on 24<sup>th</sup> March, 2018 to “Nagarjuna Sager Dam” located in Nalgonda (Dist.).

Prof.Dr.C.Selin Ravikumar, HOD and Prof.P.Bikku, Assistant Professor, Civil engineering motivated the students and explained about the importance of the visit.

## Photo Gallery of The Visit



A group of II, III & IV year students were accompanied by staff members B.Naveen Kumar, P.Anjaiah, B.Kiran Kumar, G.Swarna, P.Bikku, B.Nagendra Babu and B.Lavanya, under the guidance of Dr.Selin Ravi Kumar.

The main objective of the visit was to provide students an exposure to practical aspects and to learn through interaction with industry.

The students were divided into groups and were lead by staff members of the Dam site. Mr. Narasimma moorthy A.E explained about the dam. Students learnt about the mechanism and operation of sluice gates, dividing water to canals and power generation and storage capacity of dam, both silt and dead storage.

## S.J.C. Institute Of Technology, Chickballapur

### 1. International Conference on 'Emerging Trends in Science and Technologies for Engineering Systems (Icetstes-2018)'

S.J.C. Institute of Technology, Chickballapur organised a Two Days International Conference on 'Emerging Trends in Science and Technologies for Engineering Systems (Icetstes-2018)' on 11<sup>th</sup> and 12<sup>th</sup> January 2018.

Dr.S.R.Subramanya, Professor, School of Engineering and Computing, National University, San Diego, USA and Prof.Vivek Veeraiah, Administrative Director and adjunct Professor at New York University, Newyork addressed the gathering.

Key note address was given by Sri.Kazumasa Kuboki, Head-Japan Desk, JCSS Consulting Private Limited, Bangalore.

Poojya Sri Sri Mangalanatha Swamiji, Chickballapur Shaka Mutt, released the conference proceedings.

Highlight of the inauguration program was Sri.Kazumasa Kuboki, Head-Japan Desk, JCSS Consulting Private Limited, Bangalore singing a kannada song. It mesmerised the audience.



Participants gathered in the Inauguration of ICETSTES-2018



Address by Dr.S.R.Subramanya



Lighting the lamp from the dignitaries



Release of Proceedings by Poojya Sri Sri Mangalanatha Swamiji



Prof.Vivek Veeraiah



Dr.S.R.Subramanya



Key note address by Sri Kazumasa Kuboki



Honouring the session chair by memento and certificate

Vote of thanks was by Sri.Satish Chandra Reddy, HOD, ISE SJCIT.

Bangalore and Dr.G.Narayana, Professor and Head, Civil Engineering Department chaired the session and conducted the presentations with concluding remarks.

After the inauguration, presentation sessions started in Civil Engineering Seminar Hall. Dr.S.V.Venkatesh, Professor PES University,

## VJIT, Hyderabad

### One Day Workshop on Concrete Construction

ICI-HYDC and Civil Engineering Department, Vidya Jyothi Institute of Engineering (VJIT), Aziz Nagar, Hyderabad, jointly organized One Day Workshop on 17<sup>th</sup> March 2018 and also inaugurated the student chapter in this engineering college, an autonomous institution.

Dr. P. Venugopal Reddy –Director, VJIT was the Chief Guest and Er & Ar. S. P. Anchuri, Former G C Member, ICI & Shri P. Srinivasa Reddy, Chairman ICI-HYDC were Guests of Honour.

Both B.Tech and M.Tech civil engineering students attended the inaugural function and also





participated in the workshop. Shri.Aanchuri and Sri.Srinivasa Reddy made technical presentations on 'Certification of Concrete' and 'RMC Plants'.

Dr.Archana Dongre, HOD, welcomed the gathering and briefed about the significance of the workshop.

Er.C.Yedukondalu, Treasurer, ICI-HYDC enlightened the students about ICI and its



activities. Er.N.Mavul Rao, Secretary, ICI-HYDC explained about ICI as an institution & briefed about the network of student chapters in Hyderabad and students involvement for professional career building.

Vote of thanks was proposed by Mr.Vinith, President, ICI Student Chapter at VJIT. This one day workshop was supported by RMCMA and Instruct.

## Welcome to New Members

### A. Individual Life Members

S.No	M.No	Centre	Name	Place
1	12228	Amravati	Er Shrikant Ramkrishna Bhuskade	Amravati
2	12191		Dr Naveenkumar D.T	Bengaluru
3	12220		Er Prakash Sreenivasan	Bengaluru
4	12223		Er Savina Kumara H C	Bengaluru
5	12224		Mr Basavaraj Patil	Bengaluru
6	12225		Mr Guruprasad UBengaluru	Bengaluru
7	12227		Er B. V. Ramesh	Bengaluru
8	12178	Chandigarh	Er Chandra Bhushan Sahu	Chandigarh
9	12188	Chennai	Er Rajagopalan B K	Chennai
10	12192		Er Nagappan R	Chennai
11	12208	Delhi	Er Anupam Kumar Upadhyay	Delhi
12	12209		Er Anil Kumar Choudhary	Delhi
13	12179	Ghaziabad	Er Rajesh Kumar Singh	Gurugram
14	12229		Er Nand Kishore Bhardwaj	Noida
15	12210	Hyderabad	Dr Binaya Patnaik	Hyderabad
16	12216		Er Syed Majid Hashmi	Hyderabad
17	12211	Jaipur	Er Vikram Singh Kashyap	Jaipur
18	12204	Lucknow	Er Akhilesh Kumar Singh	Lucknow
19	12222		Er Ashok Kumar Singh	Lucknow
20	12201	Madurai	Er Rajayogan P	Virudhunagar
21	12217		Dr S.n. Ramaswamy	Srivilliputtur
22	12218		Er Shanthi Sabapathy	Coimbatore
23	12187	Mangalore	Er Jayalekshmi B R	Mangalore
24	12203	Manipur	Er Lakshmi Vara Prasad M	Cachar
25	12181	Mumbai	Er Birajdar Mahadev Limbaji	Mumbai
26	12197		Er Vandana Kaushik	Mumbai Suburban
27	12212		Mr Jayvant Ghadge	Mumbai
28	12219		Er Durga Singh Deora	Mumbai
29	12221		Er Onkar Gangadhar Kumbhar	Akluj
30	12194	Nagpur	Dr Ashish Premkishor Khatri	Nagpur
31	12205		Er Jatin Rathi	Nagpur
32	12206		Er Debarati Datta	Nagpur

33	12213		Er Avinash Durgadas Vasudeo	Nagpur
34	12214		Dr Mangesh Vasant Madurwar	Nagpur
35	12186	Pune	Er Tushar Bhalchandra Munshi	Pune
36	12189		Er Anand Dinkar Gosavi	Pune
37	12193		Er Krupali Subhashchandra Kadam	Pune
38	12195		Er Arun Gopinath Karnik	Baner
39	12200		Er Kulkarni Atul Arvind	Pune
40	12183	Thiruvananthapuram	Er Angelina Catherine B	Kollam
41	12184		Er Athira M	Kollam
42	12182	Visakhapatnam	Er Srivarma Chintalapati	Vijayawada
43	12202		Dr Palleboina Poluraju	Vaddeswaram

### B. Organizational Annual Members

44	12199	Delhi	Ranson Civil Technologies Pvt. Limited	New Delhi
45	12198	Goa	Borkars Developers Pvt Ltd	Fatorda

### C. Organizational Life Members

46	12180	Coimbatore	JCT College of Engineering and Technology	Coimbatore
47	12207	Coimbatore	Sri Ramakrishna Engineering College	Coimbatore
48	12196	Delhi	The Northcap University, Gurugram	Gurugram
49	12226	Mumbai	Sandip Foundation's Sandip Institute of Engineering and Management	Nashik
50	12154	Puducherry	Vland Engineering and Construction Pvt Ltd	Puducherry
51	12185	Pune	TSSMS Padmabhooshan Vasantdada Patil Institute of Technology	Pune
52	12175	Thiruvananthapuram	Mohandas College of Engineering and Technology	Thiruvananthapuram
53	12190	Trichy	Sastra Deemed To Be University	Thanjavur
54	12215	Visakhapatnam	R.V.R & J.C. College of Engineering	Guntur

## BOOK ON 'CONCRETE SUSTAINABILITY'

### Concrete Sustainability

"Sustainability is a major global concern and India's responsibility and leadership in this endeavor is vital being the second largest producer of concrete in the world. Authors have very systematically approached the subject with elucidation on State of the Art parameters. All the major influencing factors are considered in the form of well-illustrated chapters. I am very glad and happy that this book will be useful to any concrete practitioner not only in the country but also from other parts of the world."

**Dr. S. A. Mahajan**, Chairman and Managing Director, Students Specialty Bookings Pvt. Ltd.

"Sustainable concrete has been discussed in various forums and articles, but this book covers them under one roof. We always have built concrete structures, but were supposed to be durable for 100 years. Carbon footprint, in the last few decades, this topic has been dealt extensively from technical to professional organizations in various formats. It is well-timed with up-to-date information to help all those related to our civil engineering profession from students to practicing engineers and others."

**Dr. Rajnar M. Sahas**, IIT, Durgamachal AMOCE

**About the Book:** Global environment is getting increasingly heated up by Green House Gases (GHG), mainly carbon dioxide due to economic development and changing life styles. It is essential to control this pattern of climate change through sustainable development for the survival of future generations.

Concrete is widely used material on earth, only need to water and responsible for about 7% of global contribution of GHG. Authors in this book have highlighted various measures to reduce GHG emissions in production and use of concrete and to make it more durable, economical and sustainable.

This is the 1st Indian book on Concrete Sustainability and written with a view of Indian conditions and construction practices. The book lucidly covers all phases in the life of concrete from Cradle to Grave. It is believed that the book will make positive contribution in addressing the burning issue of climate change and sustainability and will be well received by civil engineering professionals and students alike in India and abroad.

#### About the Authors:



**N.V. Nayak** graduated in Civil Engineering from the University of Mumbai in the year 1988. He obtained his Tech from IIT Bombay and Ph.D from Missouri, U.S.A. He has 30 years' teaching, 8 years' consultancy and about 30 years of field experience. He is presently Principal Advisor at Gammon India Limited and Chief Advisor at Boccari International Pvt. Ltd. He has published many papers, over 100 lists, in National and International journals. He is the author of the popular book "Foundation Design Manual (7<sup>th</sup> Edn)", Co-author and Co-editor of the "Handbook on Advanced Concrete Technology". He is also Lecturer for PhD candidates from Mumbai University, IIT Bombay, etc. He is recipient of many awards including Lifetime Achievement Award from Indian Concrete Institute, Life Time Achievement Award of India Chapter of American Concrete Institute and Kerala Paper Award.



**A.K. Jain** graduated in Civil Engineering from University of Roorkee (now IIT Roorkee) in 1966 and did Post Graduate in Construction Management from IIT Delhi. He received University Silver Medal in Transportation Engineering.

After his short stint at CBRRI Roorkee and Irrigation Dept., IIT he joined Indian Defense Services of Engineers class in 1968. He joined Grassim Industries in 1994 and superannuated in 2003 as senior Vice President and subsequently joined as Advisor to UltraTech Cement Ltd. since June 2016. He is presently independent consultant. He is fellow of Institution of Engineers (India), Indian Concrete Institute, Indian Road Congress and various other professional bodies. He is a member of cement and concrete sub-committee of Bureau of Indian Standards.

His areas of interest are special Concrete, BMC, building materials, project management services, construction methods and value engineering. He has written more than 90 technical papers for various journals, national and international seminars. He was awarded ICI Life Time Achievement Award during 2010. He is member of Technical Board of ICI.



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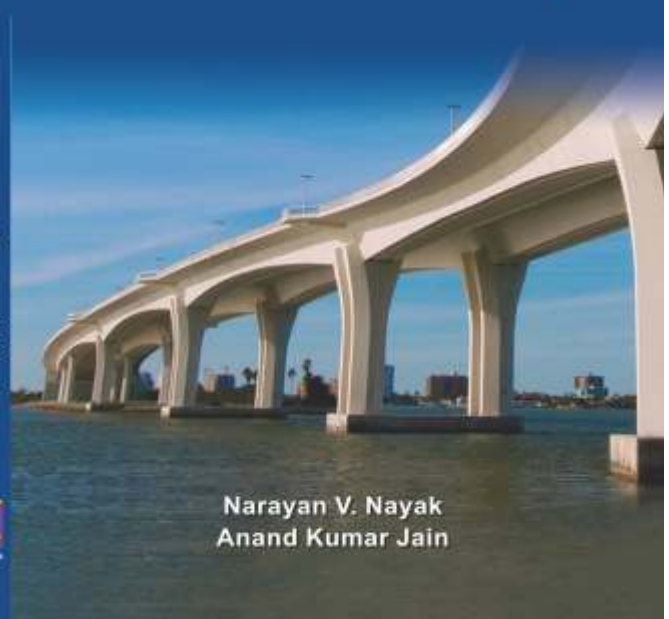
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Concrete Sustainability

Narayan V. Nayak  
Anand Kumar Jain

# Concrete Sustainability



Narayan V. Nayak  
Anand Kumar Jain

The book on 'Concrete Sustainability' has been written by Dr.N.V.Nayak and Mr.A.K.Jain. The book contains 14 chapters devoted to various aspects of sustainability of concrete construction.

The Chapter-1 deals with climate change and its future impact, while Chapter-2 elaborately deals with the use of SCMs and how they can reduce carbon footprints and save mineral resources like limestone. The Chapters 3 and 4 deal with water, its shortage and conservation in concrete construction including curing.

The Chapter-5 deals with chemical admixtures and their role in enhancing the durability of concrete and Chapter-6 deals

with aggregates derived from industrial and construction demolition waste.

The Chapters on 'Performance Based Specification', 'Use of Life Cycle Cost Analysis' are in keeping with modern advancements and thinking in concrete technology. The use of 'High Performance Concrete', Temperature Control of Concrete and Repairs and Rehabilitation Techniques has also been discussed in detail for durability and sustainability.

The book is first of its kind to be published in India on the subject of sustainability of concrete.



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