



NCB NEWS

September 2019

From the desk of Director General

As head of NCB family, I extend my heartiest greetings to the readers on 73rd Independence Day. August 15th, a sacred date for all Indians, celebrates our sovereignty and renews our resolve to fill the gaps remaining in our nation building project.

The Indian Cement Industry with current installed capacity of 510 million tonnes is a very important partner for the Government to write an inclusive growth story, a green and sustainable future, pivotal in realizing dreams of people of a “New India”. The industry, contributing significantly over the years towards employment generation, government exchequer and railways (*by way of freight*), has been a pillar of strength for the economy. Once considered otherwise, the industry has surprisingly proved itself as an environment friendly sector, consuming wastes/hazardous materials, adopting renewable energy and supporting the Swacchh Bharat Mission. The sector continues to invest towards ensuring a greener future for our generations to come.

During his speech from the Red Fort, Hon'ble Prime Minister of India pitched for freedom for India from single-use plastic. Reiterating India's commitment to tackle global challenges, PM, also highlighted country's efforts towards eliminating single use plastic at a dedicated session of G7 Biarritz summit. The decisions we take, foundations we lay, projects we undertake, and the social and economic investments we make today collectively – whether for the immediate future or for the medium term – will determine where we stand. It is with much pleasure that I wish to inform that the cement industry is already participating in the efforts to find a solution to the menace of single use plastic. The need to move towards a circular economy has pushed both waste generators and the cement industry to optimize the whole value chain from waste to a resource.

Due to nature of cement production, cement kilns are a readymade waste to energy solution. While the co-processing of plastic waste in cement industries is a viable option due to numerous advantages like high temperature and residence time in cement kilns and requirement of huge amounts of energy in clinker-making process, there are some challenges. Some of them are lack of incentives to cement industries to use such wastes, high moisture content of up to 70% of some plastic waste generated from other industries, storage and transportation of such wastes for long distances, irregular size and shape of plastics requiring pre-treatment (*shredding/ granulating etc.*) before usage.

By taking administrative actions like subsidizing the adoption of co-processing facilities, review meetings of waste generators with Pollution Control Boards, signing long term MoUs between cement plants & waste generators, awareness campaigns and technical seminars and coming out with technical solutions like developing proper storage facilities, bailing and shredding machines for plastic waste, there are several tangible and intangible benefits of co-processing plastic waste in cement kilns like reduction in overall emission of greenhouse gases, promoting concept of circular economy, utilization of waste as thermal substitute which otherwise is a serious concern, replacing an almost equivalent amount of coal and reduction in pollution, benefiting society as a whole.

Our flagship event, 16th NCB International Seminar, is being organized from December 03rd – 06th, 2019 at New Delhi. We have already received a large number of technical papers and expect the sessions to be much more lively and informative. The concurrent technical exhibition is also attracting more participation. This event provides a rare learning and networking opportunity and I appeal you all to take maximum advantage of the event.

I wish you all a very innovative and successful future. Jai Hind!



Dr. B N MOHAPATRA
DIRECTOR GENERAL

National Council for Cement and Building Materials
announces

**16th NCB INTERNATIONAL SEMINAR ON
CEMENT, CONCRETE AND BUILDING MATERIALS**

03-06 DECEMBER 2019

MANEKSHAW CENTRE, NEW DELHI, INDIA.

Website: <http://www.ncbindia.com>, www.ncbseminar.com

NATIONAL COUNCIL FOR CEMENT AND BUILDING MATERIALS

(Under the Administrative Control of Ministry of Commerce & Industry, Govt. of India)

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D G - N C B visited NCB-Bhubaneswar office and testing laboratory during June 2019 and reviewed the infrastructure facilities including



DG-NCB along with NCB-CDR officials interacted with Senior Officials of Odisha State Govt. organisations & apprised them about NCB, its Centres and Services offered to industries.

establishment of mechanical and physical testing laboratory & progress of third party quality assurance/audit projects in the state of Odisha. Target was set for getting the NABL Accreditation for Cement (*Physical Testing*), Testing of Aggregates, Bricks, Blocks and Concrete Compressive Strength before March 2020 and getting the approval of BIS for Cement Testing Laboratory after NABL Accreditation.

During the interactions with officials, it is found that there is enormous scope for development of NCB-Bhubaneswar to cater to the needs of the industry in the field of cement, concrete and building materials.

Sh Asit Tripathy, IAS, Development Commissioner cum Addl. Chief Secretary, Govt. of Odisha suggested to give detailed presentation on NCB's capabilities during the visit along with Chairman, NCB.

Sl. no	Name of Officials interacted from Odisha Govt.	Designation	Organisation
1	Sh.Kalyan Charan Mohanty	CGM (SLNA)	Industrial Promotion and Investment Corporation of Odisha Ltd (IPICOL)
2	Sh Suresh Chandra Mohapatra, IAS	Addl. Chief Secretary	Dept. of Forest & Environment, Odisha
3	Sh.Pradeep Jena, IAS	Principal Secy.	CAD, Rajiv Bhavan
4	Sh.Dhiran Kumar Samal	Chief Engineer	Monitoring & Evaluation Water Resources
5	Sh.VSS Patro	Executive Engineer	OCTMP(WR)
6	Sh. Mainak Sarkar	Capacity Building Expert	Water Resources Dept.
7	Dr.D R Mohanty	Executive Engineer	CWC, Bhubaneswar
8	Sh.Sanjay Singh,IAS	CMD - IDCO	Industrial Development Corporation of Odisha
9	Sh.Choudhury	CGM	RFID, NABARD
10	Sh.Anil Kr.Tripaty	Chief Engineer	World Bank Projects Dept. of Roads
11	Sh.Jagat Bandhu Rao	TS to Chief Engineer	Dept. of Buildings
12	Sh.Lalit Das,IPS	MD	OPHC, Odisha Police Housing Corporation
13	Sh.Rajesh Patil, IAS	CEO	Odisha Skill Development Authority
14	Sh Asit Tripathy, IAS	Development Commissioner cum Addl. Chief Secretary	Govt. of Odisha



“Investigation for Standardization of New Clinker for Blended Cement”

Research Advisory Committee of NCB approved a R&D project titled “*Investigation for Standardisation of New Clinker for Blended Cements*” starting from April 2019 with a view to enhance sustainability in cement manufacture, promote utilization of low grade limestone containing higher MgO, increase the availability of limestone for cement manufacture and increased mine life. The objective of the study was to investigate effect of high MgO clinker on performance characteristics of resultant OPC, PPC and PSC. **The project was undertaken on fast track mode and the initial studies scheduled to be completed by Sep 2019 as part of NCB’s 100 days agenda are completed and the report to be submitted to BIS is under preparation.**

Three types of high MgO clinker samples were obtained and designated as Clinker-1 (MgO~6.2%), Clinker-2 (MgO~6.8%) and Clinker-3 (MgO~7.5%). 48 nos. of cement samples of OPC, PPC and PSC were prepared by inter-grinding the constituents in a laboratory ball mill keeping the fineness level $350 \pm 10 \text{ m}^2/\text{kg}$. While PPC samples were prepared using fly ash in the range of 15-35 % by weight, the PSC samples were prepared by using GBFS in the range of 25-70% by weight.

The results of physical performance characteristics carried out as per IS:4031 indicated that in case of OPC samples, all were meeting the requirement of IS:269 except autoclave expansion. In case of PPC, the samples prepared using Clinker 1 (MgO~6.2%) and Clinker 2 (MgO~6.8%) were conforming to all the requirement of IS:1489 (Part 1). However, in case of Clinker 3 (MgO~7.5%) PPC sample containing 15% fly ash also conform all the requirement as per IS:1489 (Part 1) except autoclave expansion. **Therefore, the minimum addition of fly ash content in case of PPC samples containing Clinker 3 (MgO~7.5%) was considered to be 25% as per results obtained.**

Similarly, in case of PSC, the samples prepared using Clinker 1 (MgO~6.2%) and Clinker 2 (MgO~6.8%) were conforming to all the requirement of IS: 455. However in case of Clinker 3 (MgO~7.5%) PSC sample containing 25% GBFS conformed to all the requirement as per IS: 455 except autoclave expansion. **Therefore, the minimum addition of GBFS content in case of PSC samples containing Clinker 3 (MgO~7.5%) was considered to be 35% as per results obtained. Further studies on clinker containing MgO upto 8% are underway.**

The performance results obtained so far are quite encouraging which will pave the way for utilization of low grade limestone containing high MgO, increased mine life (~15 years) besides improved sustainability during cement manufacture. The findings shall be communicated to BIS in due course of time for their consideration. Investigations related to Hydration mechanism are continuing.

Interaction with Officials of Embassy of Switzerland



A team of experts from Swiss Cooperation Office, Embassy of Switzerland in India comprising of Sh Anand Shukla, Senior Thematic Advisor Energy, Mr Bernard Mathieu, HOP3 Consulting (Belgium) and Sh Atul Khosla called on Dr B N Mohapatra, DG-NCB on 06 August 2019. The team held wide ranging discussions on prospects of Limestone Calcined Clay Cement (LC3) in India.



Interaction with Cement Industry



NCB team led by DG-NCB visited cement plants like Vikram Cement works, Udaipur Cement works limited, Aditya Cement works, Birla Cement Ltd., Nuvoco Cement

works, Wonder Cement Limited during 3 days visit to cement plants in Chittorgarh (*Rajasthan*) cluster in July 2019. Industry shared their experiences and concerns to DG and asked NCB to come forward for speedy solutions in area of low grade limestone utilization, increasing thermal substitution rate, development of new clinker & cement standards, increase share of clean and green energy etc. Industry showed their confidence in ongoing research activities at NCB.



DG-NCB welcomed team of Senior Officials of Oman Cement Company (SAOG), Mr. Hilal Al-Dhamri, General Manager Manufacturing & Mr. Abdulaziz Al-Maqbali, Head of Quality Control Deptt. The team visited NCB Ballabgarh in July 2019 and discussed various on-going projects.



A two member NCB team from Hyderabad visited 6 cement plants in the Nalgonda & Jaggayyapeta cluster of Telangana & Andhra Pradesh respectively to discuss about the various activities carried out at NCB. During the two days programme, NCB team visited cement plants of M/s India Cements Ltd, M/s Bhavya Cements Ltd, M/s Durga Cement Works of Jaypee Cements, M/s NCL Industries, M/s Ultratech Cements Ltd (*Balaji Cement Works*) and M/s Ramco Cements Ltd.



With a purpose of sustainable coalition with industry and raw material suppliers, NCB team led by DG-NCB, organized an interaction session at

Regional Training Centre (RTC), Nimbahera in July 2019 with cement plants located in Chittorgarh cluster. Industry showed an overwhelming response with more than 30 nos. participation of dignitaries like Sh S K Rathore- President -J K Cement, Sh S M Joshi-President- Wonder Cement, Sh Ashok Khuntwal-President Vikram Cement, Sh Dinesh Kumar- Vice President- Birla Cement. Industry appreciated the deliberations and discussions that took place during the meeting and expressed confidence in NCB's capability to work in the field of new product development, exploring alternative raw materials/additives with a clean, green and sustainable cement industry growth. NCB thanks Sh N K Vaishnav, In charge- RTC (N) for co-organizing the meeting.





DG-NCB, attended 15th Green Cementech 2019 conference organized jointly by Confederation of Indian Industry (CII) and Cement Manufacturers Association (CMA) held at Hyderabad on during 30-31 May 2019. DG-NCB was invited to give Special Address in the Inaugural Session. Sh Phillip Mathew-Chairman Green Cementech 2019, Sh M K Singhi, President – CMA, Sh K N Rao, Co-Chairman-Green Cementech 2019, Ms. Aparna Dutt Sharma, Secretary General-CMA, Sh Venkatagiri, Executive Director-CII were present during Inaugural Session. DG highlighted status of cement industry's efforts and NCB R&D activities to "Make the Indian Cement Plants World Class in Green".

DG-NCB was invited for a panel discussion on Sustainability in Cement sector: Challenges and Perspective – Present and Future. The Session was chaired by Mr Sumit Banerjee, Chairman, Editorial Advisory Board, Indian Cement Review and the other panelists were Sh K N Rao, Co-Chairman-Green Cementech 2019 & Director-Energy and Environment, ACC Ltd, Sh Sandeep Srivastava, Sr Vice President-Corp. Sustainability & Environment, Ambuja Cement Ltd. Sh Ashwani Pahuja, Chief Sustainability Officer, DCBL & Sh Sivaram Krishnamoorthy, Operations Officer, International Finance Corporation. As part of panel discussions, various initiatives taken by the cement plants to reduce emissions and develop cement plants sustainable manner were highlighted. DG-NCB discussed R&D activities that are in-line with commitment towards sustainable development of cement industry.



International assignment awarded to NCB

MoU with KTPO, Karnataka



A prestigious International assignment was awarded to National Council for Building Materials by M/s Gulf Nations for Construction Material Company, Kuwait (Trade name: Baitak Cement). The assignment included the Inspection and Certification of Equipment supplied by a European OEM and Evaluation of plant operational performance. A team of 3 experts from NCB visited Kuwait from 23-4- 2019 to 05-05-2019 and successfully completed the assignment, meeting the customer's satisfaction.

NCB signed an agreement with Karnataka Trade Promotion Organization, Bengaluru, Karnataka (KTPO) in July 2019 for Third Party Quality Assurance Works to be carried out for Construction of Exhibition and Convention hall at KTPO Bengaluru. Dr. Veeranna S.H. MD-KTPO, Sh Sambasiva Rao K, Manager-KTPO, Sh Venu P R, DGM- NBCC, Sh B S Rao, Group Manger -NCB & Sh Adarsh Kumar N S, Deputy Manager- NCB, were present in the meeting of signing agreement.





Training Programmes Conducted at NCB



A Short Term Training Program on “Consumer Complaint and Handling Technique in Cement Marketing” was successfully held in July 2019 at Centre for Continuing Education Services (CCE). Professionals from cement and construction industries participated in this 3 days long programme. The participants highly appreciated the course contents as well as the faculty for the training program.



Junior Engineers (*Civil*) from Bihar State Power (*Holding*) Co. Ltd. undergoing training at National Power Training Institute (*NPTI*), NR, Badarpur, New Delhi visited NCB laboratories in July 2019 as a part of their training. DG-NCB expressed that NPTI and NCB can jointly arrange Training Programmes for the benefit of engineers working in power sector. Director-NPTI has appreciated the staff of NCB for sharing their knowledge with the engineers. The visit of engineers turned out to be highly informative and beneficial.



A two day training program on "Cracks and Leakages in Concrete Structures - Causes, Prevention, and Repair" was organised in July 2019. 47 Civil Engineers from various organizations like Rail Vikas Nigam Ltd, Reserve Bank India, NTPC, BEL, BDL, AP State Police Corporation, Singareni Collieries, TNPL, Water Resources Dept. Nagpur, LIC of India, GMR Airport, IGCAR, Nina Water proofing participated in the training programme.



The Training Program on “Sampling and Testing of Cement as per BIS Standards” was inaugurated by DG-NCB in July 2019 at Centre for Continuing Education Services (CCE). The officials from the Indian Cement Industry participated in the training program. The course aimed at imparting knowledge on Bureau of Indian Standards’ procedures on sampling and testing of cement.



Training Programmes Conducted at NCB



A Special Group Training Programme on “Quality Control and Quality Assurance in Concrete Construction for Irrigation Projects for the engineers (AEs/ AEEs Batch II) of Irrigation Management Training Institute (IMTI), Water Resources Department, PWD, Govt. of Tamilnadu” was inaugurated by DG-NCB at Centre for Continuing Education Services (CCE) in presence of Dr. D K Panda. Head of Centre, CCE, Dr. A Ranganathan, Co-ordinator, IMTI, Govt. of Tamilnadu and Sh. Brijesh Singh, Manager & Course Coordinator. The participants comprised of Asst. Executive Engineers and Assistant Engineers of Water Resources Department of Govt. of Tamilnadu.



The Training Programme on “Concrete Mix Design and Acceptance Criteria of Concrete” was inaugurated by DG-NCB in July 2019 at Centre for Continuing Education Services (CCE). Sh. V V Arora, Head of Centre, Centre for Construction Development & Research (CDR) and Dr. D K Panda. Head of Centre, CCE were present during the inauguration. Professionals from various Govt. organisations, PSUs and academic institution participated in the Training Program.



Two days training programme on “Safety Practices in Cement Industry” organized by Centre for Continuing Education Services of NCB Hyderabad during 06-07 August 2019. 15 participants from Safety departments of various cement plants have attained the training. Sh B Raja Gopala Rao, Director of Factories, Govt of Telangana, was the chief guest for inaugural session. Training was imparted on various safety aspects and safety procedures by experts from National Safety Council, Telangana State Disaster Response and Fire Services Dept., Cement Plants & NCB.



Two days training programme on “Kiln Feed Optimization to Improve Cement Quality” organized by Centre for Continuing Education Services of NCB during 30-31 July 2019. Around 23 participants from Quality & Process departments of various cement plants have attained the training.



A training program on safety from electrical hazards was organized by Safety Committee wherein DG-NCB shared his vision of electrical hazard free workplace and asked all participants to imbibe the principles of safety not only at workplace but also in their day to day life.



A Special Group Training Programme on “Quality Control and Quality Assurance in Concrete Construction” was organized for Irrigation Projects for the engineers of Irrigation

Management Training Institute (IMTI), Water Resources Department, PWD, Govt. of Tamilnadu. The participants comprised of Suptd. Engineers, Executive Engineers and Asst. Executive Engineers. The participants appreciated the training imparted by NCB faculty. DG-NCB distributed Certificates of Completion to all the participants in presence of Sh. M A Harshavarhanan and Dr. A Ranganathan, coordinators from IMTI.



National Technology Day 2019 was celebrated at NCB on 10th May. Chief Guest: Shri Vishnu Gupta, DDG (Labs) – BIS and Chief Speaker: Shri Anuj Bhatnagar, Scientist F, Head (BIS), Labs Policy & Planning, graced the occasion and discussed the latest on ISO 9001:2015 clauses and implementation.



World Environment Day 2019 was celebrated at NCB on 6th June. Chief Guest: Shri Sandeep Shrivastava, Sr. VP, Corp. Sustainability & Environment, Ambuja Cements Ltd. graced this occasion and shared his views on the theme “Beating Air Pollution” with NCB officials.

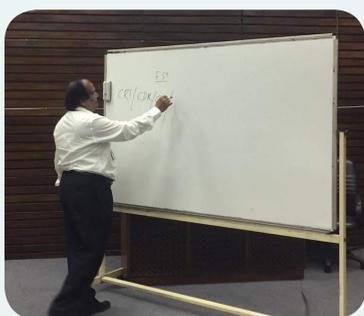


73rd Independence Day

DG-NCB, Dr B N Mohapatra hoisted the national flag on 73rd Independence Day of India and encouraged the employees for giving their best to the nation by working hard and continual improvement. In his speech, DG NCB put thrust on aligning NCB Research and Innovation projects with Sustainable Development Goals, societal requirement and Cement Sustainability.



Forum for Science & Technology (FST)



A technical presentation was delivered on “Latest Developments in Vertical Roller Mills (VRMs)” used for grinding limestone, coal, dry cement clinker and blast furnace slag in cement, steel, power and allied industries. Scientists and Engineers of NCB participated in this interactive session.

Internal Review Meeting



DG-NCB visited Hyderabad Unit and interacted with the officials of centres and discussed about the status of projects being carried out. He also identified and discussed about specific areas for taking up R&D activities and in-depth studies to serve the industry better, as well as for the benefit of NCB.

CENTRE FOR CONTINUING EDUCATION SERVICES
TRAINING PROGRAMME
September 2019-March-2020



Sl. No.	Title of the Course with Reference No.	Duration / Date	Venue
1	Non-destructive Testing and Evaluation of Concrete Structures (CCE-02/STC-21/Conc/B/2019)	3 days 18-20 September 2019	NCB-B
2	Use of Blended Cements for Durable Concrete (CCE-02/STC-26/Conc/B/2019)	3 days 16-18 October 2019	NCB-B
3	Concrete Mix Proportions and Acceptance Criteria (CCE-02/STC-29/Conc/H/2019)	3 days 20-22 November 2019	NCB-H
4	Design, Construction and Quality Control Practices for Concrete Roads for Highway & Low Volume Roads (CCE-02/STC-32/Conc/B/2019)	3 days 15-17 January 2020	NCB-B
5	Quality Control and Quality Assurance in Concrete Construction (CCE-02/STC-33/Conc/H/2019)	2 days 28-29 January 2020	NCB-H
6	Repair and Rehabilitation of Concrete Structures (CCE-02/STC-35/Conc/B/2019)	3 days 05-07 February 2020	NCB-B
7	Durability & Service Life Design of Concrete Structures (CCE-02/STC-36/Conc/B/2019)	2 days 26-27 February 2020	NCB-B
8	Non-destructive Testing and Evaluation of Concrete Structures (CCE-02/STC-38/Conc/H/2019)	2 days 05-06 March 2020	NCB-H
III SIMULATOR BASED COURSES (SBCs)			
1	Operation, Control and Optimization of Modern Grinding System based on Roller Press and Ball Mills (CCE-02/SBC-5/Sim/B/2019)	4 days 24-27 September 2019	NCB-B
6	Operation, Control and Optimization of Modern Precliner Kilns (CCE-02/SBC-6/Sim/B/2019)	3 days 06-08 November 2019	NCB-B
7	Operation, Control and Optimization of Modern Grinding System based on Vertical Roller Mills (CCE-02/SBC-7/Sim/B/2019)	3 days 11-13 February 2020	NCB-B
8	Operation, Control and Optimisation of Modern Grinding Systems based on VRM and Roller Press / Ball Mill system (CCE-02/SBC-8/Sim/H/2019)	4 Days 25-28 February 2020	NCB-H
IV CONTACT TRAINING PROGRAMMES (CTPs)			
Contact programmes are designed to suit the specific requirements of individual participants. These are practice-oriented wherein the participants practice in the laboratory right from day one to master the relevant technique/method of testing and analysis.			
1	Application of XRD for Quality Evaluation of Clinker, Cement and Raw Materials	3 Days	NCB-B / NCB-H
2	Mineralogical and Microstructural Evaluation of Coarse and Fine Aggregates, Hardened Concrete, Hydrated Cement by Optical Microscopy	3 Days	NCB-B / NCB-H
3	EDTA Methods of Analysis for Cement and Raw Materials	3 Days	NCB-B / NCB-H
4	Estimation of Free Silica	3 Days	NCB-B / NCB-H
V HANDS ON TRAINING			
1	Estimation of Chloride in Cement	2 Days	NCB-B / NCB-H
2	Estimation of Alkalies in Cement	2 Days	NCB-B / NCB-H
3	EDTA Methods of Analysis for Cement and Raw Materials	2 days	NCB-B / NCB-H
4	Estimation of Free Silica	2 days	NCB-B / NCB-H
5	Testing of Pozzolanic Materials	3 Days	NCB-B / NCB-H
6	Proximate and Ultimate Analysis of Coal	3 Days	NCB-B / NCB-H
7	Physical Testing of Cement	3 Days	NCB-B / NCB-H
8	Determination of Bond Index for Raw Materials and Clinkers	4 Days	NCB-B / NCB-H
9	Evaluation and Quality Assessment of Limestone, Slag and Cement Clinker by Optical Microscopy	3 Days	NCB-B / NCB-H
10	Estimation of Sulphide Sulphur in Granulated Blast Furnace Slag / Portland Slag Cement	3 days	NCB-B / NCB-H



CENTRE FOR CONTINUING EDUCATION SERVICES

TRAINING PROGRAMME

September 2019-March-2020

Sl. No.	Title of the Course with Reference No.	Duration / Date	Venue
VI SPECIAL GROUP TRAINING PROGRAMMES			
<i>These are customized training programmes on various aspects of cement, concrete, construction and related areas for a group of persons from a single organization</i>			
A Cement Technology Related Areas			
1	Overview of Portland Cement Technology for Sr. Executives/ Engineers	10 Days	NCB-B / NCB-H
2	Portland Cement Manufacturing Technology for Entry Level Executives	4/8 Weeks	NCB-B / NCB-H
3	Strengthening of Capabilities of Techno Marketing Executives of Cement Industry	3 Days	NCB/On site
4	Energy Audit and Energy Conservation of Cement Plant	3 Days	NCB/On site
5	Operation and Maintenance of Cement Kilns and Mills	3 Days	NCB/On site
6	Condition Monitoring of Equipment and Machinery	3 Days	NCB/On site
7	Quality System Documentation, Auditing ISO-9001 / ISO-14000 etc.	3 Days	NCB/On site
8	Comparison Study of Method of Testing of Cement and Building Materials as per IS, ASTM and EN Standards	2 Days	NCB/On site
9	Application of XRD and Optical Microscope (OM) in Quality Control and Process Optimization in Cement Industry	2 Days	NCB
10	Future Clinker/Cement Systems	2 Days	NCB/On site
B Concrete and Construction Technology Related Areas			
1	Testing and Evaluation of Concrete Making Materials	5 Days	NCB
2	Ready Mixed Concrete Technology	3 Days	NCB
3	Application of Special and Blended Cements in Construction Industry	3 Days	NCB/On site
4	IS:456-2000 : Code of Practice for Plain and Reinforced Concrete	2 Days	NCB/On site
5	IS:2386-1963 (Part I-VIII) Tests for Aggregate	3 Days	NCB/On site
6	Concrete Mix Design and Quality Control	5 Days	NCB/On site
7	Quality Control and Quality Assurance in Concrete Construction	5 days	NCB/On site
8	Modern Construction Practices for Concrete Construction	3 Days	NCB/On site
9	Cost Effective Construction Technologies	3 Days	NCB/On site
10	Design and Construction of Earthquake Resistant Concrete Structures	3 Days	NCB/On site
11	Project Management and Project Financing	3 Days	NCB/On site
12	Special Concrete in Aggressive Environments including Coastal Construction	4 Days	NCB/On site
13	Corrosion in Reinforced Concrete Structures and Remedial Measures	3 Days	NCB/On site
14	QC and QA in Concrete Construction for Hydro-electric Projects	4 Days	NCB/On site
15	Advances in Concrete Technology	4 Days	NCB/On site
16	Properties and Application of Admixtures, Corrosion Inhibitors and Permeability Reducing Chemicals including Compatibility Issues and Economic Gains	3 Days	NCB/On site
17	Repair, Retrofitting and Rehabilitation of Reinforced Concrete Structures for enhanced Service Life	3 Days	NCB/On site
18	Field and Lab Investigation Techniques for Mass Concrete Structures including causes of Distress	3 Days	NCB/On site
19	Mix Design, Optimization and Application of Fibre Reinforced Concrete for Durable Construction	3 Days	NCB/On site
20	Design of High Strength Concrete and High Performance Concrete including Material Selection and its Applications	3 Days	NCB/On site
21	Pervious, Permeable and Geopolymer Concrete and Its Applications	2 Days	NCB/On site
22	Recent Advances in Codal Provisions in Cement and Concrete Standards in India	3 Days	NCB/On site
23	Crack and Leakages in Concrete Structures and Repair Techniques for Durable and Sustainable Construction	3 Days	NCB/On site
24	ISO:17020 requirements for Quality Control and Quality Assurance	2 Days	NCB/On site
25	Uses of Supplementary Cementitious Materials for Sustainable Construction including Codal Provisions	3 Days	NCB/On site
26	Contract Management and Quality Assurance Procedures during Construction Contract Execution	2 Days	NCB/On site
27	Performance based Design of Concrete Structures from Durability Point of View	3 Days	NCB/On site
28	Effect of Mineral and Chemical Admixtures on Rheology of Concrete	2 Days	NCB/On site

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HIGHLIGHTS	SPECIFIC CONTACTS		
15th NCB Intl. Seminar (05-08 Dec. 2017) <ul style="list-style-type: none"> 1200 Delegates including 90 from 21 overseas countries. 200 Papers presented in 25 Technical Sessions 2 Invited Lectures by International Experts 119 Stalls by 80 Exhibitors in the Technical Exhibition organized concurrently. 	Email ID	Contact Details	
	Seminar	seminar@ncbindia.com ; seminar2@ncbindia.com	Tel.: +91-129-4192279, 339, 222, 2242051; Fax: +91-129-2242100 Cell: +91- 9711407555, 9868795977
	Exhibition	exhibition.ncb@gmail.com ; exhibition@ncbindia.com	Tel. & Cell: +91-129-4192342; +91-9873228225 Tel. & Cell: +91-129-4192342; +91-9555806517
	Sponsorship	sponsorship.ncb@gmail.com ; sponsorship@ncbindia.com	Tel. & Cell: +91-129-4192237; +91-9891989540
	Advertisement	ncbseminarad@gmail.com	Tel. & Cell: +91-129-4192330; +91-9810506261
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Registration Fee per Participant and Payment Schedule							
Registration	Category / Sub-Category	Date of Payment					
		Upto 31 July 2019		Upto 15 October 2019		From 16 October 2019	
		National (Rs.)	Overseas (US\$)	National (Rs.)	Overseas (US\$)	National (Rs.)	Overseas (US\$)
Delegates <ul style="list-style-type: none"> General Authors making presentation (only one per accepted paper) Govt. Organisations / Govt. R&D Institutions / PSUs / Academic Institutions Students* Accompanying Persons (Spouse only) 	General	18,000	1,350	20,000	1,500	22,000	1,650
	Authors making presentation (only one per accepted paper)	16,000	1,250	16,000	1,250	18,000	1,400
	Govt. Organisations / Govt. R&D Institutions / PSUs / Academic Institutions	14,000	1,050	14,000	1,050	16,000	1,200
	Students*	8,000	700	8,000	700	9,000	800
	Accompanying Persons (Spouse only)	6,000	200	6,000	200	6,000	200
Team Discount	One free registration (same category) for every five paid registrations.						

On cancellation of registration, refund of registration fee will be as follows:

- Upto 15 October 2019 20% deduction ● After 15 October 2019 No refund

Cancellation charges may be waived at the discretion of the Secretariat, if the originally registered delegate is in a position to arrange for an alternate in his place.

Papers & Time Schedule	LATEST (with extended dates)	Submission	Acceptance by Secretariat
	One Page Abstract (300 to 500 words)	31 July 2019	10 August 2019
	Full Paper with figures, if any	16 August 2019	31 August 2019

Technical Exhibition	Category of Exhibitor	Service Charges per sq m		Free Delegates for Each Stall		Category of Delegate
		Date of Payment		Size (mxm)		
		Upto 31 July 2019	01 August 2019 onwards	(3x3)	(3x2)	
National	Rs. 18,500/-*	Rs. 19,500/-*	02	01	Indian Nationals only	
Overseas	US\$ 700	US\$ 750	02	01	Overseas or Indian Nationals	
* Plus GST as Applicable • Only 118 stalls are available • Stalls shall be booked on first-pay-first-served basis • No refund on Cancellation • Details of layout, facilities and terms and conditions will be sent to interested exhibitors on request • Visit ncbindia.com for details. • Exhibitors will be given 50% discount on Advertisement rates in Seminar publication						

Advertisement Rates: Advertisement will be printed in the publication of Seminar Publication. The details:

Advertisement Position	Print Area (mm)	National (Rs.) + Gst Extra	Overseas (US\$)
Full Page	180 x 240	40,000	1,500
Half Page (Horizontal)	180 x 115	20,000	1,000
Half Page (Vertical)	85 x 240	20,000	1,000

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For cancellation policy, terms of participation and OTHER DETAILS PLEASE READ BULLETIN-1.

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