ANNUAL REPORT
2024-25

National Council for Cement and Building Materials

(under the administrative control of DPIIT, Ministry of Commerce and Industry, Govt. of India)

Annual Report 2024-25

1st April 2024 to 31st March 2025

National Council for Cement and Building Materials

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

34 Km Stone, Delhi-Mathura Road (NH-2), Ballabgarh-121004, Haryana

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Message from desk of Chairman

Dear Stakeholders, I hope that this message finds you in good health and high spirits. It gives me great pleasure to present the annual report of National Council for Cement and Building Materials (NCB), apex body for research, technology development & transfer, continuing education, calibration and testing services in the areas of in areas of cement, concrete and building materials. NCB's commitment to innovation and keeping up with latest developments for benefit of industry such as reduction in carbon footprint, conservation of natural resources, energy & environment, productivity, quality control and assurance, is an encouraging sign of things to come ahead in near future. I'm glad to note that NCB have been working on Carbon Capture and Utilisation, to help cement industry achieve the goal of Net Zero by 2070.

NCB is significantly contributing to the growth of cement industry by providing valuable services like raw mix design, limestone consumption factor, energy and environment audits, process diagnostic studies, through the execution of sponsored projects and conducting extensive material testing in its laboratories accredited by NABL and recognized by BIS. In addition, NCB also carries out calibration services and provides Certified Reference Materials (CRMs) and Bharatiya Nirdeshak Dravya (BNDs) to various industries.

Based on the requirements of industry, NCB has undertaken programmed projects specifically focusing on development of pre-combustion technology, calciner electrification, use of low lime industrial waste etc. NCB also conducts training programmes for the professionals of cement and concrete sector. It is satisfying to know that NCB has successfully completed not only eight important Research Projects but also 143 Sponsored Projects during the previous financial year, in addition to conducting 26 Training Programs and 328 professional that have effectively disseminated knowledge and expertise to professionals within the industry.

NCB has undertaken revision of Norms for Proving Limestone Deposits for Cement Manufacture. NCB has also worked on development of methodology for estimation of kaolinite content in Indian quality clay. Significant progress has also been made in the domain of serving as a Project Management Consultant (PMC) to international cement plants. This achievement has established NCB's position as a dependable consultancy service provider in this part of the world, catering to the global cement industry.

In the concrete and construction sector, NCB has been evaluating a variety of concrete-making materials and carrying out concrete mix designs for various grades of concrete and special application concretes. NCB has undertaken study on Mechanical and Durability Performance of CO_2 sequestered sintered ash lightweight aggregate in concrete and effect of fire on the residual mechanical properties of reinforcing bars and structural performance of reinforced concrete Beams in flexure & Shear.

NCB has been biennially organizing the International Conferences on Cement and Building Materials, which is considered as one of the biggest events for cement and construction industry in this part of the world. The 18th NCB International Conference & Exhibition on Cement, Concrete and Building Materials was held from 27th to 29th November 2024 at Yashobhoomi Convention Centre, New Delhi. The conference saw participation of 1100+ delegates, 600+ visitors, 140+ students, 16 session keynote addresses, 155 oral presentations and 70 poster presentations of technical papers, 133 Exhibitors including 09 StartUps and 204 Exhibition Stalls. Overall, it was one more successful event organized by NCB which benefited the whole cement, concrete, building material and allied industries.

The preparations for the prestigious 17th International Congress on the Chemistry of Cement (ICCC), being organised by NCB in collaboration with IIT Delhi and IIT Madras, are well underway. The Congress is scheduled to be held from 18th to 22nd October 2027 at Yashobhoomi, New Delhi. This event will also provide us with a unique opportunity to showcase India's advancements in research, sustainability, and innovation in the cement sector.

At this point, I would like to thank Department for Promotion of Industry and Internal Trade (DPIIT), Government of India for providing the financial support to research needs of NCB and look forward for continued and enhanced support from DPIIT in future for taking up new programmed projects as well for timely completion of ongoing projects.

I would also like to thank my fellow members in the Board of Governors and its Committees for their valuable advice and guidance in decision making on various issues from time to time. I am confident that NCB would continue to provide the much-needed technical support to the industry in the years to come.

Neeraj Akhoury
Chairman-NCB

October 2025

Message from desk of Director General

I am pleased to present the Annual Report for the year 2024-25 to all the stakeholders of NCB like cement and concrete fraternity, government, academia, scientific institutions, civil society and society as a whole. The report contains the achievements of NCB through its programmed projects and the activities that have been carried out during the year. With its innovative approach and sincere efforts, NCB has executed eight research and development projects and 143 sponsored projects maintaining standards, quality and timeliness.

India has committed to become Net Zero by 2070 and cement industry contributes around 7% of total anthropogenic CO_2 emissions. NCB has focused its research and innovation initiatives on decarbonization, carbon capture & utilization and adoption of renewable energy and implementation of circular economy aligning with the objectives of the government, industry and society.

In the area of cement research and testing, NCB has undertaken the revision of NCB publication entitled Norms for Proving Limestone Deposits for Cement Manufacture, investigations on use of low lime industrial wastes, lump formation in bags and usage of zinc waste & other metal extraction residues in cement manufacture. During the year, NCB has completed 17 LCF studies and developed plant specific secondary standards of cement raw materials and finished products for 24 plants. Also, more than 7628 samples were tested by cutting-edge Independent Testing Laboratories in accordance with National and International Standards.

Sponsored R&D projects from Bureau of Energy Efficiency were undertaken on RDF/biomass gasification, AF dryer and use of solar thermal in cement industry. During the year, 16 mandatory energy audits for various cement plants apart from heat & gas balance studies, process optimisation studies, assessment of air pollution control equipment etc. were successfully carried out. The Project Management Consultancy services for installation of 600 tpd Green Field Cement Plant Project at the Republic of Congo is under progress and expected to complete by December 2025. Furthermore, R&D projects like calciner electrification, development of pre-combustion technology for increasing TSR, development of CO_2 emission factor and biogenic index of alternative fuels used in cement industry are continuing.

In concrete technology, under various program activities like material evaluation of wide range of concrete mix designs for special applications, alkali aggregate reaction studies, evaluation of integral crystalline waterproofing compound, study on Mechanical and Durability Performance of CO_2 sequestered sintered ash lightweight aggregate in concrete utilization of CO_2 in Fresh Concrete and its properties, effect of fire on properties of reinforcing bars and reinforced concrete beams in flexure & Shear and testing of coarse and fine aggregate materials. The centre aids to build durable infrastructure in India for prestigious projects of national importance by offering

specialized services in quality assurance and control and durable repair strategies for distressed RCC structures.

In quality management and calibration area, 23 Bhartiya Nirdeshak Dravyas (BNDs) have been developed in collaboration with CSIR-National Physical Laboratory (NPL), envisioned to boost "Make in India" program and fulfil the mission of "Atmanirbhar Bharat". Supply of 3012 CRMs and 1380 sets of standard lime was continued. 1500 Calibration services were also provided with more than 95% clients rating NCB's services as excellent.

NCB imparted training on cement, concrete and construction technologies through its various special, short-term and refresher courses. During the year 2024-25, 26 training programmes were successfully organized with a total participation of 328 professionals from cement, concrete and construction industries.

NCB along with IIT Delhi and IIT Madras will be organising the 17th International Congress on the Chemistry of Cement (ICCC) at Yashobhoomi Convention Centre, New Delhi from 18th to 22nd October 2027. Hosting this esteemed event in India provides us with a unique opportunity to bring together the leading leaders, experts, and innovators in cement sector from around the world.

The 18th NCB International Conference & Exhibition on Cement, Concrete, and Building Materials, a Maha Kumbh of Cement and Concrete Industry, was successfully organized from 27 - 29 November 2024 at Yashobhoomi Convention Centre, IICC Dwarka, New Delhi, India. The three-day conference saw participation of more than 1100 delegates, 600+ visitors and, 140+ students.

I am grateful to DPIIT, Ministry of Commerce & Industry, Govt. of India, the Board of Governors and its sub-committees for their vision, guidance and constant inspiration. I extend my sincere thanks to my colleagues for their support, cooperation and commitments in completing the projects. I express gratitude to the industry for its continued support and patronage. Jai Hind!

Dr. L P Singh
Director General

October 2025

National Council for Cement and Building Materials

(A Premier R&D Organisation under the Administrative Control of Ministry of Commerce & Industry, Govt. of India)

Vision

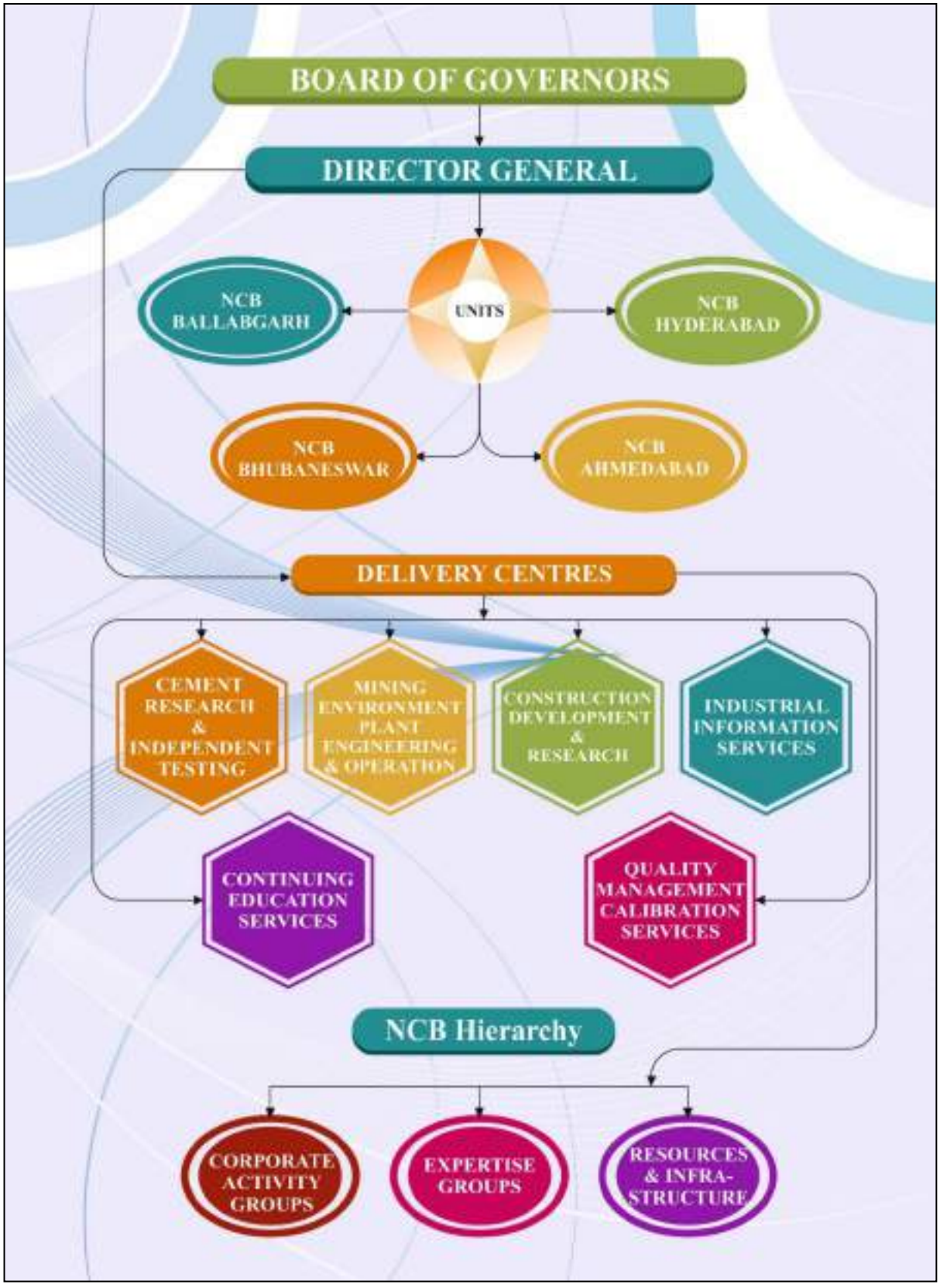
Be a preferred technology partner to cement and construction sectors in the sustainable development of a better infrastructure and housing.

Mission

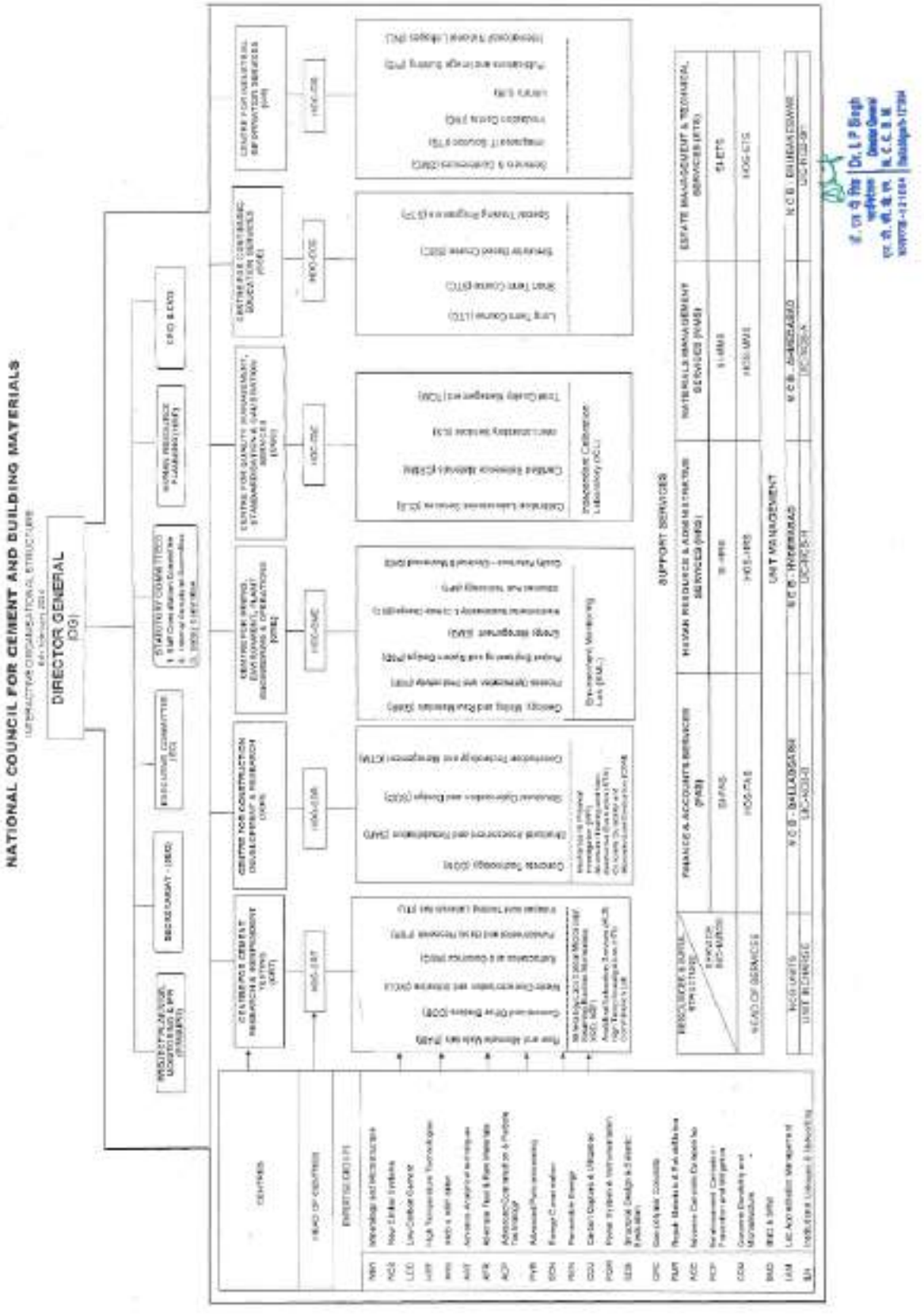
Research and Development of innovative technologies, their transfer and implementation in partnership with cement and construction industries.

- To enhance quality, productivity and cost-effectiveness
- To improve the management of materials, energy and environmental resources
- To develop competency and productivity in human resources
- To develop technologies for durable infrastructure and affordable housing

NCB Hierarchy



NCB Organization Structure



Introduction of NCB

National Council for Cement and Building Materials (NCB), the then Cement Research Institute of India (CRI) was founded on 24th December 1962 with the objective to promote research and scientific work, connected with cement and building materials trade and industry.

NCB is premier autonomous R&D organisation under the administrative control of Department for Promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce and Industry, Govt. of India, devoted to technology development &, transfer, continuing education and industrial services for cement and construction industries. It is registered as a society under the Societies Registration Act, 1860. NCB serves as the nodal agency for providing the Government of India with the necessary support for formulation of its policy and planning activities related to growth and development of cement industry.

It is devoted to protect the interests of consumers of cement and concrete in the country. NCB's stakeholders are Government, Industry and Society, who perceive NCB's role as discharging national responsibility, providing adequate technology support and improving the quality of life respectively. Geographically, NCB has its corporate unit and main laboratories located at Ballabgarh (near New Delhi) and regional units at Hyderabad (Telangana), Ahmedabad (Gujarat) and Bhubaneshwar (Odisha). The units of NCB-Ballabgarh, Hyderabad and Ahmedabad are ISO 9001:2015 certified.

NCB's areas of work span over the entire spectrum of cement manufacturing and usage starting with geological exploration of raw materials through the processes, the machinery, the manufacturing aspects, energy and environmental considerations to the final utilization of materials in actual construction, condition monitoring & rehabilitation of buildings and structures.

NCB provides ISO 17025:2017 accredited testing and calibration services and ISO 17043:2023 accredited proficiency testing (PT) services. It also develops and supplies certified reference materials (CRMs) to cement and construction sector as per ISO 17034:2016. For human resource development, NCB imparts training to professionals of cement, concrete and building materials sectors through short term and long-term courses. NCB's Post Graduate diploma in cement technology for one year duration is approved by AICTE. In the area of industrial information services, NCB organizes international seminars/conferences on cement, concrete and building materials. It has organised 18 editions of this seminar/conference so far.

All these activities of NCB are channelized through six corporate centres:

- **Centre for Cement Research & Independent Testing (CRT):** Centre is responsible for research activity in the areas of cement and other binders, waste utilization, refractory and ceramics, fundamental & basic research and raw &

alternative materials. It also looks after testing activities of cement and cementitious materials and other building materials.

- **Centre for Mining, Environment, Plant Engineering & Operation (CME):** Centre carries out its activity in the area of geology, mining and raw materials, environmental sustainability & climate change, process optimization & productivity, energy management, project engineering & system design, advanced fuel technology and quality assurance (electrical & mechanical).

- **Centre for Construction Development & Research (CDR):** Centre is responsible for research activities in the area of structural assessment and rehabilitation, concrete technology, construction technology and management and structural optimization and design.

- **Centre for Quality Management, Standards & Calibration Services (CQC):** Centre provides services to the industry in the area of proficiency testing, standards reference materials, calibration services and total quality management.

- **Centre for Industrial Information Services (CIS):** Centre provides the IT infrastructure. Centre also looks after the publications, seminar and conferences, international and national linkage and image building of NCB.

- **Centre for Continuing Education Services (CCE):** Centre organizes need-based industry-oriented training programmes in the area of cement, concrete and construction sector.

NCB has the following four service groups to support the technical activities of above six corporate centres.

- **Finance and Account Services (FAS):** FAS is responsible for managing all day-to-day financial activities

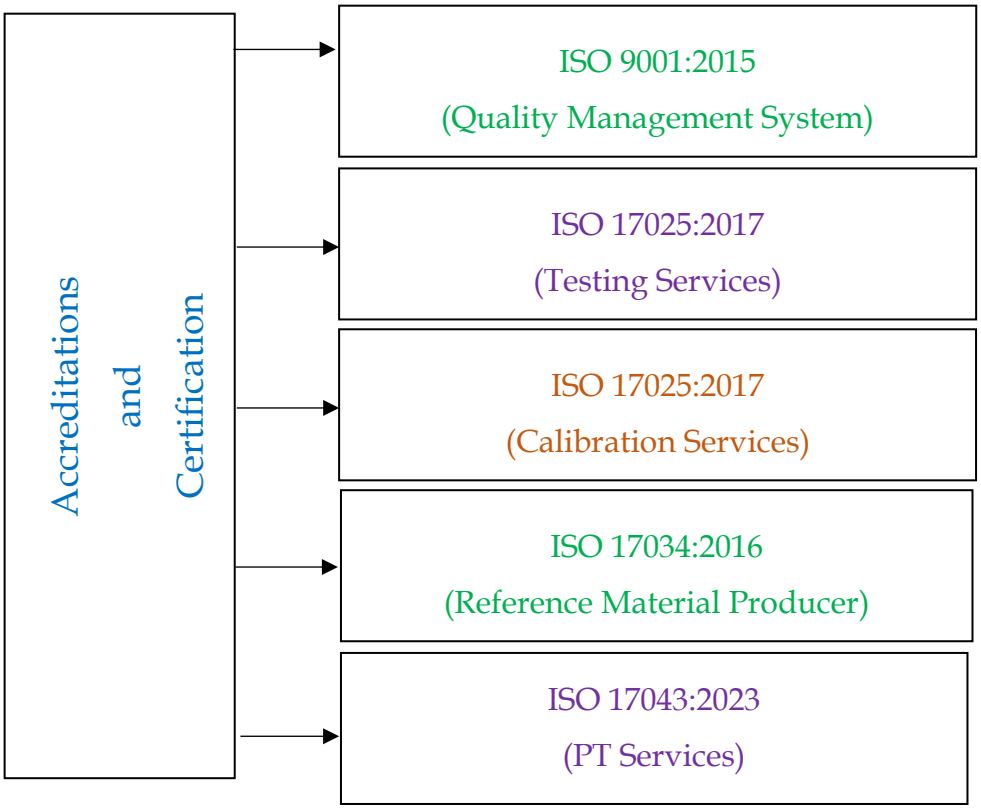
- **Human Resource and Administrative Services (HRS):** HRS-GEN provides the transportation resources and HRS-PER is responsible for human resources activity such as recruitment, promotion, appraisal etc.

- **Estate Management and Technical Services (ETS):** The infrastructure including resources such as workspace, utilities, equipment and communication technology infrastructure are maintained by ETS.

- **Materials Management Services (MMS):** MMS is responsible for purchase of materials including raw material as well as equipment as per the requirements of different departments of organization.

NCB's Commitment to International Quality Standards

NCB in its commitment to achieve excellence has adopted world class practices and implemented international standards for Quality Management System. NCB's quality management system is certified as per ISO 9001:2015. NCB provides world class Testing, Calibration, Proficiency Testing and Reference Material Producer. Activities which are accredited as per International Standards.



Quality Management System Certification as per ISO 9001:2015

ISO 9001 is international standard published by International Organization for Standardization which specifies requirements for quality management system with the aim to enhance customer satisfaction, ability to provide reliable products and services meeting customer's requirements and expectations. NCB implemented ISO 9001 since 2002. NCB-Ballabgarh, NCB-Hyderabad and NCB-Ahmedabad units are ISO 9001:2015 certified.

Quality Objectives

We commit ourselves to:

1. Pursue global standards of excellence in all our endeavours, covering: Research, Design and Development, Technology Transfer, Continuing Education, Calibration and Testing Services in the areas of Cement, Construction and Building Materials.

2. Satisfy all our stakeholders- Government, Industry and Society.

3. Continually improve the Quality Management System.

4. Comply with the requirements of ISO 9001:2015 Quality Management System and other applicable requirements.


BVMS CERT

CERTIFICATE OF REGISTRATION

National Council for Cement and Building Materials

ISO 9001:2015

CERTIFICATE ZERTIFIKAT CERTIFICATO CERTIFICADO

ISO 17025:2017- Testing Services

ISO/IEC 17025:2017 is international standard published by International Organization for Standardization and International Electro Technical Commission. ISO/IEC 17025:2017 specifies the general requirements for the competence, impartiality and consistent operation of laboratories involved in testing, calibration and sampling. NCB implemented ISO/IEC 17025 for its testing services since 1998. NCB provides complete physical, chemical, mineralogical and micro-structural analysis of various types of raw materials, cement, clinker, pozzolana, aggregate, concrete, admixtures, water, refractory, bricks, coal, lignite, Environment parameters etc. & Non-Destructive Testing as per National and International standards.

Quality Policy

Testing laboratories of National Council for Cement and Building Materials, Ballabgarh are committed to provide reliable and accurate test results to the total satisfaction of customers in accordance with the stated methods and customer's requirement.

National Accreditation Board for Testing and Calibration Laboratories

CERTIFICATE OF ACCREDITATION

NATIONAL COUNCIL FOR CEMENT AND BUILDING MATERIALS (TESTING LABORATORIES)

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2017

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

in the field of

TESTING

Signed for and on behalf of NABL

ISO 17025:2017 – Calibration Services

ISO/IEC 17025:2017 is international standard published by International Organization for Standardization and International Electro Technical Commission. This standard specifies the general requirements for the competence to carry out tests and/or calibrations, including sampling. NCB implemented ISO/IEC 17025 for its calibration services since 1998. NCB provides quality calibration services in the field of force, mass, pressure, volume, rpm and dimension fields.

Quality Policy

Independent Calibration Laboratories of National Council for Cement and Building Materials, Ballabgarh, are committed to provide reliable, accurate, calibration results to the total satisfaction of customers in accordance with the stated methods and customers' requirements. The laboratories are committed for ensuring impartiality, integrity and confidentiality of customer data, with efforts for continual improvement of management system and consistent operations.

Quality Objectives

1. Providing reliable calibration services, accurately and timely, to the satisfaction and requirements of customers;
2. Laboratory personnel are committed to carry out laboratory activities in an consistent and competent manner with utmost integrity, impartiality and ensuring confidentiality of customer data;
3. Continual improvement of effectiveness of management system, continual training of laboratory personnel and up gradation of services and facilities in accordance with changing customer requirements and relevant specifications;
4. Continual improvement of customer satisfaction; To meet the above objectives, the laboratories follow the management system appropriate to scope of their activities and meet the requirements of NABL criteria of accreditation and IS/ISO/IEC 17025:2017 – "General requirements for the competence of testing and calibration laboratories" and are provided with necessary resources.


CERTIFICATE OF ACCREDITATION

INDEPENDENT CALIBRATION LABORATORIES,
NATIONAL COUNCIL FOR CEMENT AND
BUILDING MATERIALS

ISO/IEC 17025:2017

"General Requirements for the Competence of Testing & Calibration Laboratories"

CALIBRATION

ISO 17034: 2016 – Reference Material Producer

ISO 17034:2016 is international standard published by International Organization for Standardization. This standard specifies "General Requirements for the Competence of Reference Material Producers" for the Development of Certified Reference Material. NCB implemented ISO 17034:2016 since March 2021. NCB provides Certified Reference Materials in the area of cement and cementitious materials including solid fuel (Coal).

Quality Policy

Standard Reference Material of National Council for Cement and Building Materials, Ballabgarh, are committed to provide highest quality of Certified Reference Materials to customers, to produce RMs which conform to the requirements as per International Standard, to conduct all testing and calibration in support of the production of RMs in compliance with ISO/IEC 17025.

SRM programme are also committed to follow good professional practices and continually improve the effectiveness of the management system. All personnel concerned with SRM programme activities shall familiarize themselves with quality documentation and implement the policies and procedures in their work.

Quality Objective

1. To increase resource generation
2. To provide efficient and reliable services, to the satisfaction and requirements of customers;
3. To continually improve and upgrade SRM programme services;
4. To improve feedback of participants and customers.
5. To analyze and improve the management system, CRM development and customer service.


National Accreditation Board for Testing and Calibration Laboratories

CERTIFICATE OF ACCREDITATION

STANDARD REFERENCE MATERIAL, NATIONAL COUNCIL FOR CEMENT AND BUILDING MATERIALS

ISO 17034: 2016

"General Requirements for the Competence of Reference Material Producers"

REFERENCE MATERIAL PRODUCER

ISO 17043:2023 – Proficiency Testing Services

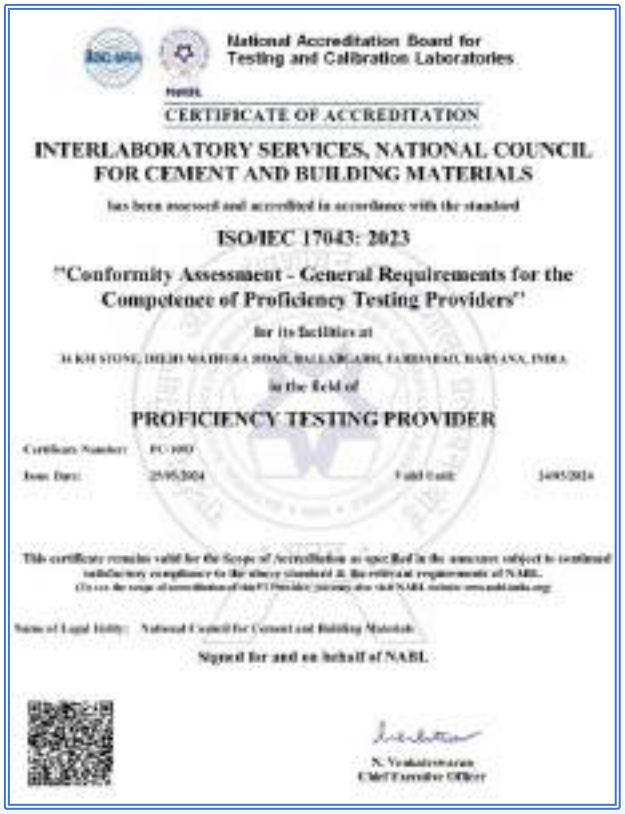
ISO/IEC 17043:2023 is international standard published by International Organization for Standardization and International Electro Technical Commission. This standard specifies general requirements for the competence of providers of proficiency testing schemes and for the development and operation of proficiency testing schemes. NCB implemented ISO/IEC 17043 since 2013. NCB provided proficiency testing services in testing of various building materials like cement, clinker, fly ash, limestone, coal/coke, granulated slag, water, steel, aggregate etc.

Quality Policy

Interlaboratory Services of National Council for Cement and Building Materials, Ballabgarh, are committed to provide highest quality of proficiency testing services to participants and other customers.

Quality Objectives

1. To provide efficient and reliable proficiency testing services, to the satisfaction and requirements of proficiency testing participants and other customers.
2. To continually improve and upgrade proficiency testing services.
3. To improve feedback of participants and customers.
4. To analyze and improve the management system, proficiency testing schemes. And customer service.



National Accreditation Board for Testing and Calibration Laboratories

CERTIFICATE OF ACCREDITATION

INTERLABORATORY SERVICES, NATIONAL COUNCIL FOR CEMENT AND BUILDING MATERIALS

has been assessed and accredited in accordance with the standard

ISO/IEC 17043: 2023

"Conformity Assessment - General Requirements for the Competence of Proficiency Testing Providers"

for its facilities at

in the field of

PROFICIENCY TESTING PROVIDER

Signed for and on behalf of NABL

N. Venkateswaran
Chief Executive Officer

Board of Governors (BOG)
Composition of BOG

Chairman

Shri Neeraj Akhoury
President-CMA and
Managing Director
Shree Cement Ltd.

Members

Shri Rajendra Chamaria
Vice Chairman-NCB &
Chairman-Chamaria Group
(Ex-VC & MD, Star Cement Ltd.)

Smt. Arti Bhatnagar
Special Secretary & Financial Advisor,
DPIIT, Ministry of Commerce &
Industry, Govt. of India

Shri Sanjiv
Joint Secretary (Cement Division)
DPIIT, Ministry of Commerce &
Industry, Govt. of India

Shri Santosh Kumar Yadav, IAS
Chairman
National Highways Authority of India

Director General
Bureau of Energy Efficiency

Shri K C Jhanwar
Managing Director
UltraTech Cement Limited

Shri Ajay Kapur
CEO (Cement Business)
Adani Group

Shri M S Gilotra
Managing Director & Non-Independent
Executive Director
Saurashtra Cement Ltd.

Shri Deepak Khetrapal
Managing Director & CEO
Orient Cement Limited

Shri Jayakumar Krishnaswamy
Managing Director
Nuvoco Vistas Corp. Ltd.

Shri Madhav K Singhania
Joint Managing Director & CEO
J.K. Cement Ltd.

Shri Mahendra Singhi
Director and Strategic Advisor
Dalmia Cement (B) Limited

Chairman
NAREDCO

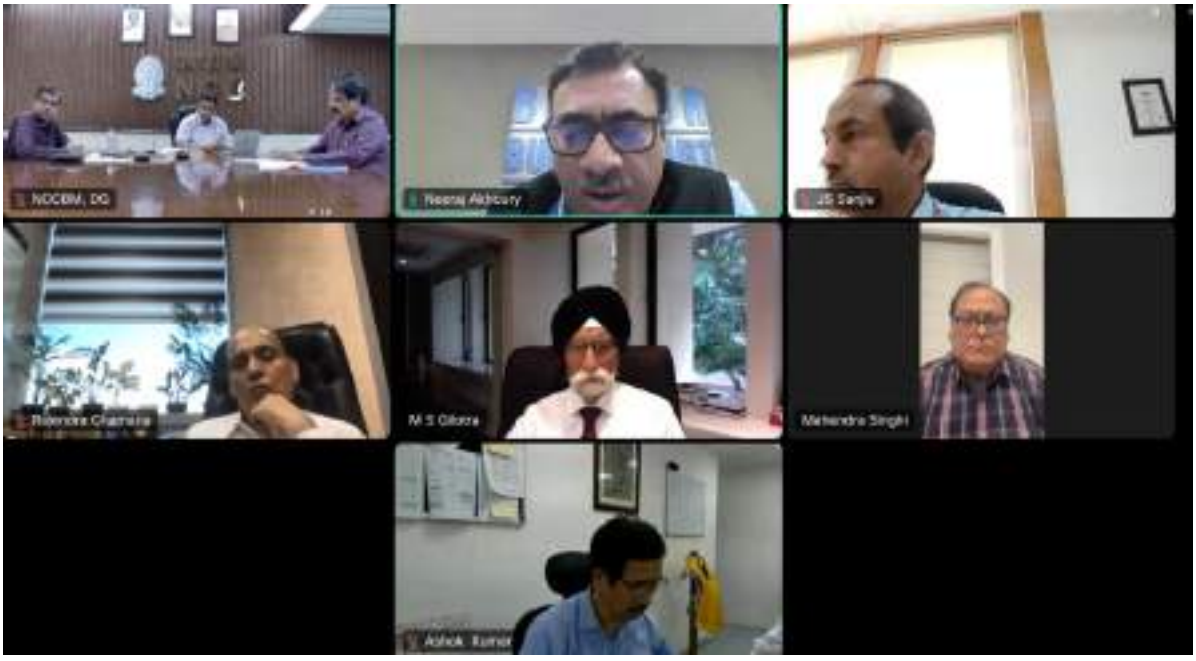
Dr L P Singh
Director General-NCB

Meetings of Board of Governors (BOG)

Board of Governors (BOG) is the highest decision-making body of NCB and is aided by various committees like Administrative and Finance Committee (AFC), Infrastructural Development Committee (IDC), Research Advisory Committee (RAC) and Advisory Committee for Hyderabad & Bhubaneswar (ACH) of NCB to make informed decisions on multiple issues relating to finance, manpower, service matters and rules.

BOG of NCB for the years 2023 & 2024 was constituted by DPIIT, Ministry of Commerce and Industry, Government of India on 29th November 2023.

The 126th and 127th meeting of Board of Governors (BOG) was held on 27th September 2024 and 31st January 2025 respectively, under the Chairmanship of Shri Neeraj Akhoury, Chairman-NCB, President-CMA and Managing Director, Shree Cement Ltd through video conference.



126th BOG Meeting on 27th September 2024

Corporate Advisory Committees

Research Advisory Committee (RAC)

RAC advises on all aspects pertaining to Programmed R&D and industrial support services in NCB, with particular reference to technology forecasting, technology planning, programmes, strategies and methodologies and the overall project programme of NCB. RAC is composed of eminent and learned technocrats representing Indian cement and concrete industry, technology suppliers, officials from Ministry of Commerce and Industry, Government of India, academia, Bureau of Indian Standards (BIS), and Director General-NCB etc. The RAC members meet twice in a year. The detailed composition is given below:

Chairman

Shri M S Gilotra
Managing Director & Non-Independent Executive Director
Saurashtra Cement Ltd.

Members

Prof. S K Bhattacharya
Vice Chairman (RAC)
Vice Chancellor
Shiv Nadar University, Chennai

Prof. Shashank Bishnoi
Professor (Civil Engg.)
Indian Institute of Technology Delhi

Director (Cement)
DPIIT, Ministry of Commerce & Industry, Govt. of India

The Director
Central Building Research Institute
Roorkee

The Deputy Director General
Geological Survey of India

Prof. R G Pillai
Professor (Civil Engg.)
Indian Institute of Technology Madras

Shri Ashwani Pahuja
Chairman & MD
NextCem Consulting Pvt. Ltd.

Dr. Awadhesh Singh
Sr. VP & Head (Product Assurance)
UltraTech Cement Ltd.

Shri D Bhadra
Director (Civil Engg.) & Head
Bureau of Indian Standards

Dr. Rajeev Goel
Chief Scientist
Central Road Research Institute

Shri Raju Goyal
Chief Technology Officer
Ultratech Cement Ltd.

Secretary General
Cement Manufacturers' Association

Dr. S K Saxena
Unit Head
J K Lakshmi Cement Ltd.

Shri Pankaj Kejriwal
Director
Star Cement Ltd.

Shri Satish Upadhyay
Executive Director - NTPC Limited
Mission Director - Samarth National Biomass Mission, Ministry of Power, Govt. of India

Shri Shaswattam
CGM, NTPC Ltd. (Netra)

Shri J P Vrati
Astt. ED, Quality
Dalmia Cement Bharat Ltd.

Dr. L P Singh
Director General - NCB

Head of Centres of NCB

Dr. Manish V Karandikar
Vice President
Adani Cement Ltd.

Ms. Lopamudra Sengupta
Vice President - Technical Services
JSW Cement Ltd.

Dr. Pranav Desai
Vice President (Technical & Development)
Nuvoco Vistas Corp. Ltd.

Dr. Neelima Alam
Scientist (F)
Climate Change in Clean Energy Division, DST, Govt. of India

Dr. Mukesh Kumar
Associate VP
Technical Walling Solution

Shri Amit Trivedi
Member Secretary, RAC - NCB

Shri Brijesh Singh
Coordinator, RAC - NCB

Advisory Committee for NCB–Hyderabad & Bhubaneswar

In an endeavor to reach out to the cement and construction sectors in South India and for sharing NCB's Research and Innovative initiatives, Advisory Committee for NCB-Hyderabad & Bhubaneswar has been constituted. The committee deliberates on various aspects of development of NCB–Hyderabad & Bhubaneswar and its activities. It focusses in particular on the development & utilization of infrastructural facilities of the Units and industrial & training services rendered by it.

The Composition of NCB-Hyderabad & Bhubaneswar has officials from Central/State Government Departments: Cement & Construction Industry, Research Institutes (IIT/NIT/BITS). The detailed composition is given below:

Chairman

Shri Rakesh Singh
Executive President
The India Cements Ltd.

Members

Shri Anil Gupta
Chief Manufacturing Officer
ACC Ltd.
Unit: Wadi Cement Works

Shri Anoop Kumar Saxena
Chief Executive Officer
Bharathi Cement Corp. Pvt. Ltd.

Shri Seetharamulu Ch
Unit Head
Chettinad Cement Corp. Pvt. Ltd.

Shri S Venkateswarlu
Director-Works
Deccan Cements Ltd.

Shri Umashankar Choudhary
Plant Head
J K Cement Ltd.

Shri Hari Kumar, IAS
Managing Director
Malabar Cements Ltd.

Shri K Subbulakshmanan
Unit Head
Ambuja Cements Ltd.
Unit: Maratha Cements Works

Shri B M Mahana
HOD-Production
Cement Corporation of India Ltd.

Shri Mukesh Kumar Sinha
Plant Head
Dalmia Cement (B) Ltd.

Shri Navneet Chauhan
Plant Head
JSW Cement Ltd.

Shri V S Narang
Director (Technical)
My Home Industries Pvt. Ltd.

Shri D Lakshmikantham
Director-Technical
Penna Cement Ind. Ltd.

Shri Jashvanth Krishna
CEO & MD
Parasakti Cement Industries Ltd.

Shri S Sreekanth Reddy
Joint Managing Director
Sagar Cements Ltd.

Shri Madhusudhan Rao
Vice President
The K C P Ltd.

Shri Ashish K S
Plant Head
The Ramco Cements Ltd.

Shri G N B Rao
Plant Head
Zuari Cement Ltd.

Dr. V Ramachandra
Vice President (Technical) - South
UltraTech Cement Ltd.

Shri Kantilal Nanda
Plant Head
NU Vista Ltd.

Shri Chetan Shrivastav
Executive Director
OCL India Ltd. (Dalmia Cement)

Govt. Organisations & Educational Institutes:

Shri K V Rao
Scietist-F & Head
Bureau of Indian Standards

Prof. K V L Subramaniam
Indian Institute of Technology

Shri P Ravinder Rao
Engineer-in-Chief, State Roads & CRN
R&B Department

Shri Cheeti Muralidhar
Engineer-in-Chief
Irrigation & CAD Department
Govt. of Telangana

Shri V G Venkata Reddy
Director of Mines & Geology
Govt. of Andhra Pradesh

Shri B R V Susheel Kumar
Director, Mines & Geology
Govt. of Telangana

Shri P Satyanarayana Reddy, IAS
Member Secretary
Telangana State Pollution Control Board

Dr. Dinakar Pasla
Associate Professor
School of Infrastructure
Indian Institute of Technology-Bhubaneswar

Infrastructural Development Committee (IDC)

Infrastructural Development Committee (IDC) advises the Board of Governors on various aspects of land, building services, equipment and facilities at the various NCB Units and to cause these infrastructural developments to be carried out at the various NCB Units and to assist in conducting the affairs of the unit in such a manner as to fulfill the set objectives with the programmes, policies and guidelines laid down by the board. The composition of the committee is given below:

Chairman

Shri M K Singhania
Jt. MD & CEO
J.K. Cement Ltd.

Members

Prof. Umesh Sharma
Professor (Civil Engineering)
Indian Institute of Technology Roorkee

Dr. Rakesh Kumar
Chief Scientist
Central Road Research Institute

Dr. Manish V Karandikar
Vice President
Adani Cement Ltd.

Shri Sanjay Mehta
President (Procurement & Corporate Affairs)
Shree Cement Ltd.

DG-NCB

An NCB Official nominated by DG-NCB – Member-Secretary

Joint Directors and Heads of concerned Service Groups

Administration and Finance Committee (AFC)

Administration and Finance Committee (AFC) advises the Board of Governors on issues relating to financial planning, budgets, accounts, manpower growth plan and service matters including various rules of NCB. To take decisions on behalf of the Board of Governors on individual personnel cases and on issues of administrative nature as may be referred to it, by the Board or by the Director General-NCB. All such decisions are reported to the Board at its immediate next meeting through the relevant status report. The composition of the committee is given below:

Chairman

Shri Rajendra Chamaria
Vice Chairman NCB &
Chairman – Chamaria Group

Members

The Director (Cement)
DPIIT, Ministry of Commerce & Industry, Govt. of India

The Director
Integrated Finance Wing
DPIIT, Ministry of Commerce & Industry, Govt. of India

Shri K K Jain
Vice President (Finance)
Shree Cement Limited

Shri C K Bagga
Vice President (Fin. & A/Cs)
JK Lakshmi Cement Ltd.

Shri Dharmender Tuteja
Chief Financial Officer
Dalmia Cement (Bharat) Ltd.

DG-NCB
Joint Directors and Heads of concerned Service Groups

An NCB Official nominated by DG-NCB – Member-Secretary

Annual General Meeting (AGM)

Chairman

Shri Neeraj Akhoury
Managing Director
Shree Cement Ltd.

Members

Shri Rajendra Chamaria
Vice Chairman-NCB
VC& MD, Star Cement Limited

Shri M S Gilotra
Managing Director
Saurashtra Cement Ltd.

Shri Sunil Khandare
Director, BEE

Shri Mahendra Singhi
Board of Directors & Strategic Advisor,
Dalmia Cement (B) Limited

Dr A K Singh
UltraTech Cement Ltd

Dr V Ramachandra
UltraTech Cement Ltd

Shri S Gopinath
CEO, SICMA

Shri J P Vrati
Dalmia Cement (B) Ltd.

Shri Gulshan Bajaj
HeidelbergCement India

Md. Jamal Siddiqui
Nuvoco Vistas Corp Ltd

Dr Manish Karandikar
Adani Group

Ms Lopamudra Sengupta
JSW Cement

Shri A K Dhar
NHAI

Shri S K Jain
Star Cement Ltd.

Shri S K Singhal
Saurashtra Cement Ltd

Shri Dilip Yadav
Shree Cement Ltd

Dr L P Singh
Director General, NCB

Shri Satyendra Kumar
Shree Cement Ltd

Dr D K Panda
Joint Director, NCB

Dr S K Chaturvedi
Secretary & Joint Director, NCB

Shri Amit Trivedi
Joint Director, NCB

Dr B P R Rao
Joint Director, NCB

Dr Sanjay Mundra
General Manager, NCB

Shri Anand Bohra
Manager, NCB

Executive Committee (EC)

With a view to achieve the objectives of collegiate management and to assist the Director General to deal with the various functions, the Executive Committee, comprising heads of various Divisions of activities with the Director General as its Chairman. The composition of the committee is given below:

Chairman

Dr. L P Singh
Director General-NCB

Secretary

Dr. S K Chaturvedi#
HoC-CRT, HoS-FAS & UIC- NCB-Ballabgarh

Members

Dr. D K Panda	HoC-CME, HoC-CCE & HoS-HRS
Shri P N Ojha	HoC-CDR & UIC-NCB-Ahmedabad
Dr. B Pandu Ranga Rao	UIC-NCB-Hyderabad & NCB-Bhubaneswar
Shri Amit Trivedi*	HoC-CQC
Shri G J Naidu	HoC-CIS
Dr Sanjay Mundra##	HoS-FAS
Shri A K Popuri**	HoS-MMS
Shri Brijesh Singh	HoS-ETS

HoS-FAS: #till 3rd January 2025 & ##from 3rd January 2025
HoS-MMS: *till 3rd January 2025 & **from 3rd January 2025

Corporate Advisory Committee Meeting

Corporate Advisory Committee Meetings

77th Meeting of Research Advisory Committee (RAC)

77th Research Advisory Committee (RAC) meeting of National Council for Cement and Building Materials was held under the chairmanship of Shri M S Gilotra, Managing Director, Saurashtra Cement Ltd. at NCB-Ballabgarh office on 21st March 2025.

Research and Development (R&D) by NCB is taken up through the recommendations of Research Advisory Committee (RAC).

RAC is composed of experts from the Government of India, Research Institutes & Academia, cement & construction industry, consultants and NCB, which advises on all aspects pertaining to Programmed R&D and industrial support services in NCB, with reference to technology forecasting, technology planning, programmes, strategies and methodologies and the overall project programme of NCB.

During the meeting, outcomes of 08 completed R&D projects, progress of 08 nos. ongoing R&D projects, and 11 new project proposals to be taken up from FY 2025-26 were presented.

77th RAC Meeting

52nd Meeting of Infrastructural Development Committee (IDC)

The 52nd meeting of Infrastructure Development Committee (IDC) of NCB was held in hybrid mode on 18th June 2024 under the chairmanship of Shri Madhav K Singhania, Joint MD and CEO, J K Cement Ltd. The meeting was attended by Prof. Umesh Sharma, Professor (Civil Engineering), Indian Institute of Technology, Roorkee; Dr. Rakesh Kumar, Chief Scientist, Central Road Research Institute, New Delhi and Head of Centres/Service Groups of NCB. The committee deliberated on upgradation of NCB's infrastructure and laboratory facilities to further improve customer satisfaction and its research capabilities.

IDC is one of the sub-committee of Board of Governors (BOG) of NCB to advise the Board of Governors on issues related to various aspects of land, building services,

equipment and facilities to fulfill the set objectives with the programme, policies and guidelines laid down by the board of NCB.


52nd IDC Meeting

67th Meeting of Administration & Finance Committee (AFC)

The Virtual meeting of 67th Administration & Finance Committee (AFC) meeting was held on 5th June 2024 under the Chairmanship of Sh. Rajendra Chamaria.

The Committee took vital decisions on behalf of the Board of Governors on individual personnel cases and on issues of administrative nature which were referred to it by the Board and by DG-NCB.

Virtual meeting of 67th AFC

61st Annual General Meeting (AGM)

The 61st Annual General Meeting (AGM) of National Council for Cement and Building Materials (NCB) was held on 28th November 2024 at Yashobhoomi Convention Centre, New Delhi.

Shri Neeraj Akhoury, Chairman-NCB, President-CMA and MD, Shree Cement Ltd. addressed the 61st AGM of NCB and highlighted the achievements of NCB during the year. He stated that NCB's current Research projects are well aligned to national priorities besides addressing current R&D requirements of cement industry. He lauded the role played by NCB in skill development of cement professionals and for providing certified reference materials to cement industry.

Representatives of cement industry appreciated the services rendered by NCB for Indian cement industry.

61st AGM Meeting

NCB's Programmes and their Fulfilment

The Corporate Programmes

NCB continues to be a preferred research & development and consultancy partner for the cement and construction industry. With its state-of-art laboratories and reinforced by the experienced scientists and engineers and pro-active leadership, NCB has been providing innovative technological solution to overcome the hurdles faced by industry and nation at large.

Govt. of India Schemes and Missions		NCCBM's Activities
Skill India	Pradhan Mantri Kaushal Vikas Yojana (PMKVY)	NCCBM's Centre for Continuing Education (CCE) and Centre for Industrial Information Services (CIS) through its 22 expertise has been organizing various industry oriented training programmes for professionals of all levels & students and Seminars / Workshops / Online Training/Webinars for cement, concrete, construction and building material sectors. Beneficiaries: Entire Cement Industry, IAF, RBI, BRO, Indian Post, Indian Railways, CPWD, PWD & Water Resources Department of various State Governments, BPCL, HPCL, IOCL, DMRC, NBCC India Ltd., NHPC Ltd., Power Grid Corp. of India Ltd., NTPC, GAIL India Ltd.
MAKE IN INDIA	Make in India	NCCBM's Centre for Quality Management, Standards & Calibration Services (CQC) is promoting "Atma Nirbhar Bharat" and "Make in India" programs by developing 18 Bhartiya Nirdeshak Dravya (BNDs) for cement and cementitious materials to reduce the import of foreign Standard Reference Materials. CQC provides Proficiency Testing services as well as Calibration services traceable to National / International Standards in various fields of force, temperature, mass & volume, dimension, pressure and RPM.
COP26	Target to Achieve Net Zero by 2070	NCCBM's Centre for Cement Research and Independent Testing (CRT) has undertaken extensive research for Clinker Substitution to reduce specific CO_2 emissions of cement by development of: • Low Carbon Clinker • Portland Composite Cement based on fly ash and Limestone • Portland Limestone Cement and • Portland Dolomite Cement • Multi component blended cement
PAT SCHEME	PAT Scheme of BEE under National Mission for Enhanced Energy Efficiency (NMEEE)	NCCBM's Centre for Mining, Environment, Plant Engineering and Operations (CME) has carried out over 200 Energy Audits of cement plants for improving Energy Efficiency under the Perform Achieve & Trade (PAT) scheme of Bureau of Energy Efficiency (BEE), Ministry of Power, Govt. of India. CME is also carrying out research on ways to maximize Waste Heat Recovery and utilize Renewable Energy in cement related operations
	Smart Cities Mission	NCCBM's Centre for Construction Development and Research (CDR) has undertaken research projects such as high strength concrete & Ultra High Performance concrete and is providing reliable technical services to ensure durable and sustainable infrastructure by undertaking Third Party Quality Assurance and Audit of Construction Projects such as Convention Centres, Buildings, Bridges, Tunnels, Roads etc. Beneficiaries: CPWD, PWD, IDCO Odisha, Telangana, Power Grid Corp. Ltd., ITPO (Pragati Maidan), International Convention Centre Dwarka, Ambedkar Memorial, NTPC, Bhakra Dam, AIIMS, MCD, DDA etc
	Swachh Bharat Mission	NCCBM's Centre for Construction Development and Research (CDR) has done extensive research on utilization of C&D waste as well as other industrial waste as iron slag, copper slag, bottom ash ferrochrome slag etc. as an alternative to natural fine and coarse aggregates; utilization of sintered flyash as coarse aggregate in structural light weight concrete and development of Geopolymer Cement and Concrete systems. NCCBM's Centre for Cement Research and Independent Testing (CRT) & Centre for Mining, Environment, Plant Engineering and Operations (CME) are actively working with cement industry for utilization of various wastes as Alternative Fuels and Raw Materials to enhance TSR from 4% to 25% by 2030.

Services were provided in the areas of development of newer products, optimal utilization of resources be it limestone, gypsum or industrial waste, Alternate Fuel & Raw materials (AFR), circular economy, process optimization, energy studies, plant maintenance, structural assessment and rehabilitation, quality assurance in construction, concrete technology, materials evaluation, application of nanotechnology, dissemination of information through conferences & training programmes and total quality management.

NCB has carried out Limestone Consumption Factor (LCF) studies for cement plants from all over the country and so far, established the same for 292 cement plants. During the year, LCF studies were completed for 17 cement plants from Madhya Pradesh, Andhra Pradesh, Telangana, Maharashtra and Rajasthan. NCB developed plant specific secondary standards of cement raw materials and finished products. The study has been carried out so far for 24 cement plants covering 48 matrixes. This year the study has been carried out for 6 cement plants from Karnataka, Rajasthan, Madhya Pradesh, Maharashtra and Andhra Pradesh.

NCB has taken up R&D studies on revision of NCB publication entitled norms for proving limestone deposits for cement manufacture, investigations on use of low lime industrial wastes for carbon capture and utilization, technical suitability of utilization of zinc slag generated from zinc industries in manufacturing of cement (phase-I), investigations on utilization of fly ash generated by co-firing of biomass in cement manufacturing, investigation of lump formation in cement bags and technical suitability of post metal extraction residue-I (vanadium lean) & post metal extraction residue-II (nickel lean) in manufacturing of cement.

Independent Testing (INT) Laboratories of NCB undertake complete physical, chemical, mineralogical and microstructural analyses of various types of cement, clinker, raw materials, additives, pozzolana, aggregate, concrete, admixture, water, admixture, refractory, bricks, coal, petcoke, lignite etc. as per national and international standards. The number of samples tested during the period was more than 7628.

In the areas of process & productivity, NCB carried out optimization of heat balance & energy consumption, optimization of Raw Mills, and Investigations on lump formation in cement bags.

In the areas of energy management, NCB has carried out more than 250 detailed energy audits till date in various cement plants. Energy audit studies in cement plants include assessment of energy management, monitoring and target setting, detailed heat balance and gas balance studies, identification of potential for thermal and electrical energy savings and recommendations for remedial measures, techno economic feasibility studies for waste heat recovery system (WHRS) etc.

In the areas of project engineering and system design (PSD), NCB serving as a Project Management Consultant (PMC), Managing project implementation and helping with project supervision for setting up a 600 tpd Cement Plant in RoC for Government of Republic of Congo. Package-II (Engineering, Construction and Supply of Cement plant) is under progress and expected to complete by December 2025. To enhance the utilization of waste as Alternative Fuels in Indian cement Industry, Bureau of Energy Efficiency has funded for the project for design and development of the Alternative Fuel dryer. NCB undertaken studies on development of pre-combustion technology for AF burning and increasing TSR in Indian Cement Plants, vetting the techno commercial proposal from parties for RDF Char plant, preparation of a TEFR for a 3000 tpd cement plant for Berbera Cement, Somaliland and installation of Multi-Channel Multi Fuel Burner and Additional Bag Filter For Coal Mill.

In the areas of advanced fuel technology (AFT), NCB has undertaken a study sponsored by Bureau of Energy Efficiency on Process design and integration of RDF/biomass gasification to cement plant calciner to enhance alternative fuel utilization in Indian cement industry. NCB has undertaken study on electrifying the cement calciner for capturing carbon dioxide from the cement industry.

In the areas of environment sustainability & climate change (ESC), GHG assessment was carried out for three years covering Scope I and Scope II emissions. Water Footprint Assessment was carried out for three years based on the data provided by the plant. Performance Assessment of Existing Air Pollution Control Equipment was taken up for a cement plant in Assam, under which the stacks of major APCE attached with Kiln/Raw Mill, Coal Mill, Cooler were monitored.

The Quality Assurance Group (QAG) provides end to end Third Party Quality Assurance solutions for MEP works in various types of establishments like Hospitals, Schools, Convention Centers, Street lighting works, Sewage Treatment Plant, Effluent treatment plant etc.

In the areas of Concrete Technology, NCB has conducted evaluation of wide range of concrete making materials such as cement, fly ash, silica fume, Ground Granulated Blast Furnace Slag (GGBS), water, fine aggregates, coarse aggregates, chemical admixtures etc. and has successfully carried out important projects for prestigious clients. During the period of 2024-25, more than 19 sponsored projects of material characterization and about 50 mix designs were completed. Concrete mix designs for special applications such as Self-Compacting Concrete (SCC), Pavement Quality Concrete, Design of Roller Compacted Concrete and Design of Dry Lean Concrete have been carried out successfully for various clients. NCB over the years has developed expertise and competencies to evaluate aggregates for potential alkali aggregate reaction which includes both alkali silica reaction and alkali carbonate reaction. About 16 numbers of coarse and fine aggregates were evaluated for various prestigious clients. NCB over the years has developed the necessary expertise and competency to evaluate aggregates for potential alkali aggregate reaction which includes both alkali silica reaction and alkali carbonate reaction. NCB has also developed mechanism for the assessment of integral crystalline waterproofing compounds and their performance in concrete as well as mortar. NCB has evaluated 4 numbers of crystalline water proofing compounds for various industrial clients like ITD Cementation India Ltd., CPWD, and Pidilite Industries limited.

In the areas of Structural Optimization & Design, effect of fire on the residual mechanical properties of reinforcing bars and structural performance of reinforced concrete Beams in flexure & Shear, were studied.

In the areas of Structural Assessment & Rehabilitation, a wide range of activities related to assessment of new and existing concrete structures are carried out which includes condition assessment of existing concrete structures including fire damaged concrete structures, investigation of material properties of hydraulic structures such as dams, application of non-destructive testing for conformity of quality and condition assessment of concrete structures, preparation of repair estimates including cost estimates and detailed schedule of items for repair and rehabilitation works, consultancy services involving quality inspection and third party quality assurance of repair and rehabilitation works of concrete structures, Research & Development Projects on modern repair technologies etc.

In the areas of Construction Technology and Management, NCB provides Third Party Quality Assurance services for the wide range of construction projects such as multistoried residential buildings, commercial complex, school buildings, convention centers, Exhibition halls, flyovers, elevated corridor, dams, barrage, concrete roads, ROB & RUB, bridges and tunnels, construction utility projects, office building , hospitals buildings , special construction activities like pre-engineered steel structures, etc., built by the various central / state /PSU/ autonomous organizations across India. The scope of Third Party Quality Assurance / Audit includes inspections, lifting and testing of samples, witness of field and laboratory testing done at site / fabrication yard, review of quality system and documents including Non-Destructive Testing (NDT) wherever applicable.

NCB's Centre for Quality Management, Standards & Calibration Services (CQC) is promoting "Atma Nirbhar Bharat" and "Make in India" programs by developing Bhartiya Nirdeshak Dravya (BNDs) for cement and cementitious materials to reduce the import of foreign Standard Reference Materials.

CQC provides Proficiency Testing services as well as Calibration services traceable to National/ International Standards in various fields of force, temperature, mass & volume, dimension, pressure and RPM.

NCB's SRM programme is accredited under ISO 17034:2016 as Reference Material Producers. NCB has developed Certified Reference Materials (CRMs) in the areas of cement, building materials and solid fuels (coal and pet coke). NCB's CRMs have been quoted in IS 4031(Part-2), IS 4031(Part-15) and IS 1727.

23 Bhartiya Nirdeshak Dravyas (BNDs), the Indian Certified Reference Materials (CRMs) were developed in collaboration with CSIR-National Physical Laboratory (NPL), NMI of India. During the year, total 3,012 units of different CRMs including BNDs and 1,380 sets of standard lime were supplied to 1361 customers of cement plants, testing laboratories, public sector undertakings, R&D institutions including international clients viz Nepal, Bhutan, Bangladesh, Tanzania etc. More than 1500 equipment/instrument were calibrated at NCB's testing laboratories and at customer's site. The Laboratories have developed new Laboratory Infrastructure equipped with state-of-the-art equipment like Force Calibration Systems - 2 to 200 kN, Facilities for calibration of Weights from 1mg-150 kg, Volumetric Glassware and Pressure-1.5 to 1400 bar. The calibration services are being provided to various Central Govt., State Govt., PSUs, Cement & Construction Industries and have shown remarkable growth. It is pertinent to mention that 95% customers rated our services as excellent in the last financial year. NCB's Interlaboratory Services (ILS) is accredited under ISO/IEC 17043:2023, thus NCB is first accredited PT provider in India. In 2024-25, NCB completed 13 PT schemes. The participants were mainly from reputed private laboratories, cement plants, govt. laboratories, public sector laboratories etc.

The 18th NCB International Conference & Exhibition on Cement, Concrete, and Building Materials, a Maha Kumbh of Cement and Concrete Industry, was successfully organized from 27 - 29 November 2024 at Yashobhoomi Convention

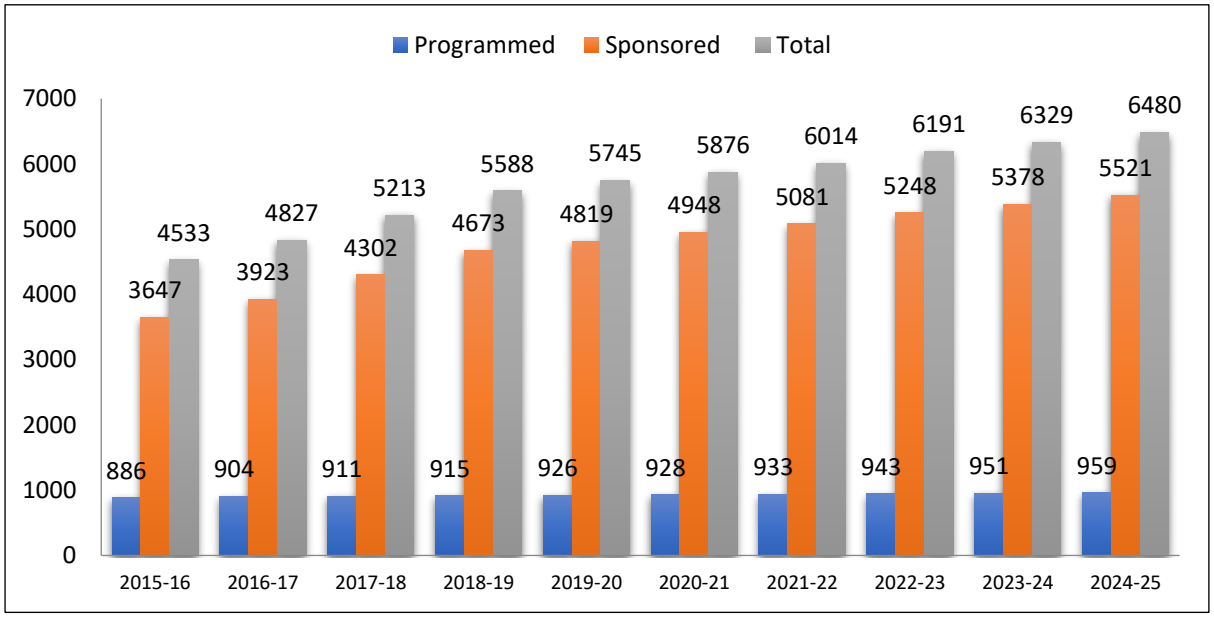
Centre, IICC Dwarka, New Delhi, India. The conference saw participation of 1100+ delegates, 600+ visitors, 140+ students, 16 session keynote addresses, 155 oral presentations and 70 poster presentations of technical papers, 133 Exhibitors including 09 StartUps and 204 Exhibition Stalls.

Considering the training needs of the industry, NCB conducted 26 training programmes on cement, concrete and construction technologies. During the year 2024-25, 26 training programmes (offline/online) were successfully organized with a total participation of 328 professionals from cement, concrete and construction industries.

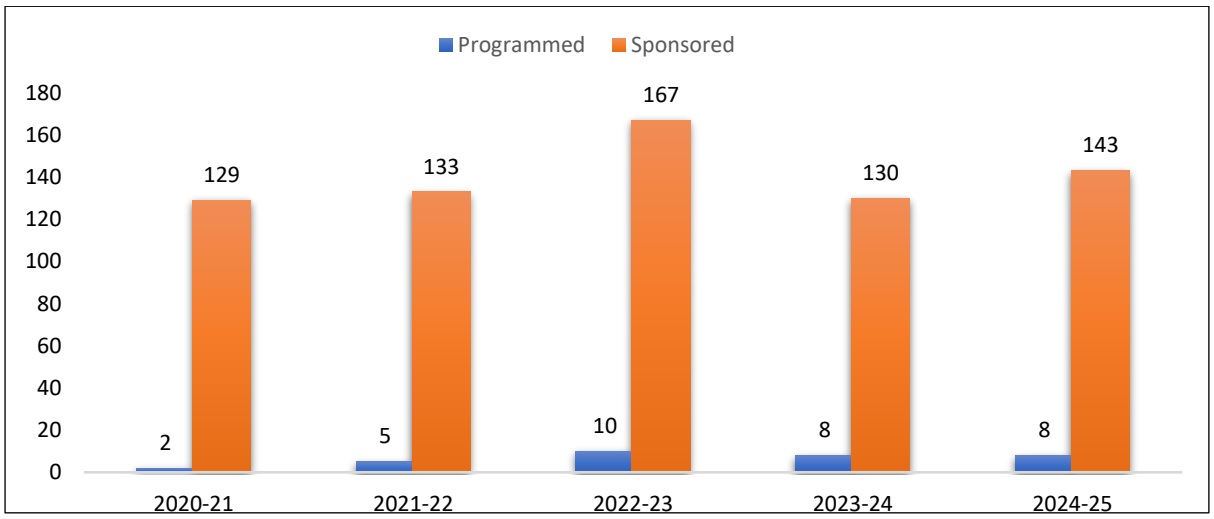
Framework of Institutional Efforts

The activities of the Council were carried out under the six Corporate Centres at NCB's Units/project offices, situated in Ballabgarh, Ahmedabad, Hyderabad and Bhubaneswar. While the infrastructure is physically distributed over these Units, all the Units are involved in the execution of projects or services as necessary following the matrix approach.

During the year, 08 R&D projects and 143 Sponsored projects were completed as listed in Appendices II and III respectively. The programmed projects carried forward along with the new ones taken-up, comprised the R&D Programme for 2024-25, as given in Appendix IV. The broad activities carried out by the six Corporate Centres are highlighted in the following sections.



Projects Completed by NCB (Cumulative)



Project Completed by NCB

NCB Ballabgarh

Centre for Cement Research and Independent Testing-(CRT)

The Centre executes its activities through six programmes viz. Cements and Other Binders, Wastes Utilization, Refractories and Ceramics, Fundamental and Basic Research, Raw and Alternate Materials and Independent Testing. During the year, 36 Sponsored Projects, 4 Programmed Projects were completed and 2 Programmed Projects were pursued.

Cements and Other Binders

Establishing Limestone Consumption Factor (LCF)

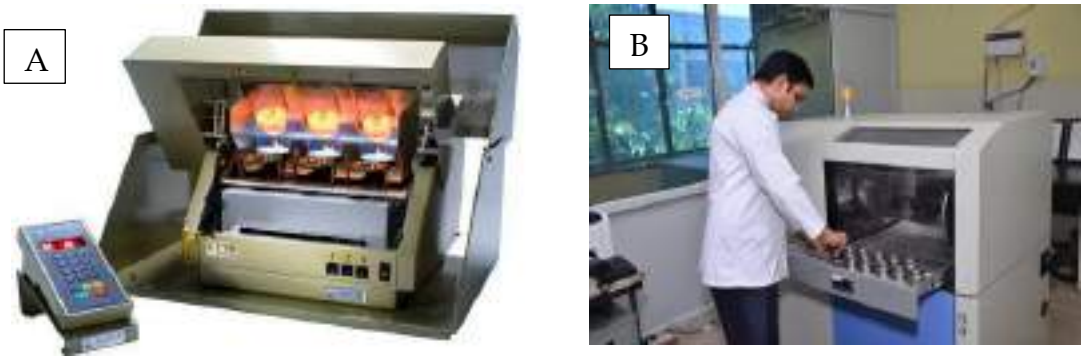
LCF studies are very important from the point of view of rationalization of limestone consumption in production of cement, estimating royalty payable to state for the limestone mined from their respective captive mines besides internal material audit of the concerned cement plants. NCB has carried out Limestone Consumption Factor (LCF) studies for cement plants from all over the country and so far, established the same for 292 cement plants. During the year, LCF studies were completed for 17 cement plants from Madhya Pradesh, Andhra Pradesh, Telangana, Maharashtra and Rajasthan.

Drop test during LCF studies conducted by NCB and plant officials in M/s RCCPL Pvt Ltd. M.P

Mine Visit by NCB and plant officials in M/s ACC Ametha, M.P.

Development of Plant specific secondary standards for XRF calibration.

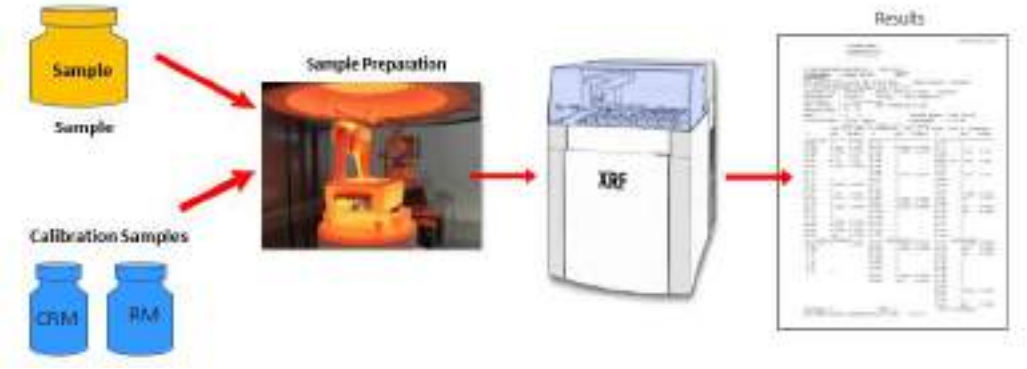
XRF plays crucial role in quality control in cement plants. Accuracy of the results of XRF for the most part depends on the standards used for the calibration of equipment. NCB developed a programme for preparation of plant specific secondary working standards for calibration of XRF, so as to maximize the accuracy of the results. NCB successfully completed several projects for the various materials being used in cement industry, viz., limestone, additives, raw meal, kiln feed, clinker, cement etc. Collected samples from the plants are analyzed in NCB laboratories using different analytical techniques for chemical composition. Assigned true values after the analysis of generated data from different NCB laboratories are used to calibrate the XRF of plant laboratories. Critical samples like check samples, drift correction sample etc. along with developed standard samples are provided to the plants for regular monitoring of the performance of XRF.



Picture showing (A) Fusion Bead preparation (B) Sample loading for XRF analysis

Standard reference materials are used for this purpose. Secondary standard is a compound/chemical that has been standardized against a primary standard. Secondary standards are commonly used to calibrate analytical methods. Secondary standards are required as only limited no. of primary standards is available (one to four), range of the primary standards is not adequate, matrix and mineralogy may be different, evenly spaced samples across the calibration curve not achieved.

NCB has taken up studies for development of plant specific secondary standard materials.NCB developed plant specific secondary standards of cement raw materials and finished products. The study has been carried out so far for 24 cement plants covering 48 matrixes. This year the study has been carried out for 6 cement plants from Karnataka, Rajasthan, Madhya Pradesh, Maharashtra and Andhra Pradesh.



Schematic representation of XRF secondary standard calibration

Revision of NCB publication entitled Norms for Proving Limestone Deposits for Cement Manufacture

The NCB Publication titled "Norms for Proving Limestone Deposits for Cement Manufacture", was last published in 2003 as 3rd edition and referred by professionals both in India and abroad and also by decision making bodies, for techno-economic evaluation of the limestone deposit, to judge the adequacy of the exploration, sampling etc. For the revision of the above said publication a committee was formed and the whole document was reviewed by the members.

In the present edition, the approach has been to synchronize the exploration requirement as per the MMDR Act, 1957 and the Mineral (Evidence of Mineral

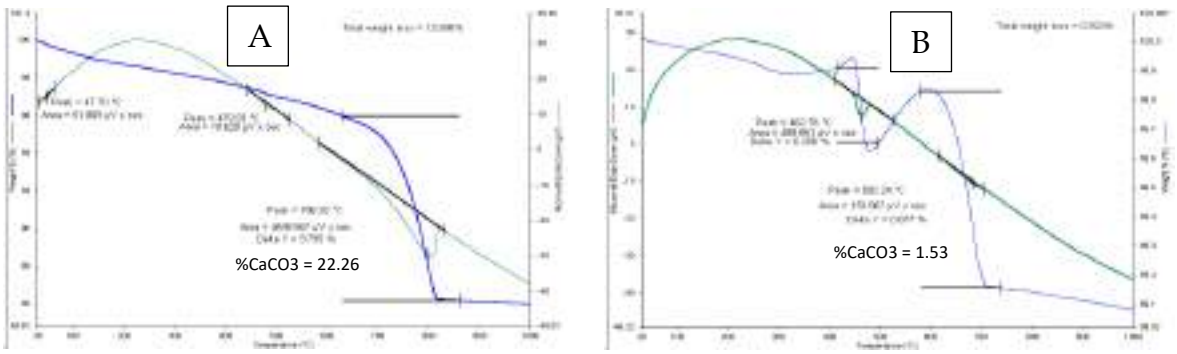
Contents) Rules, 2015 which guides the minimum extent of exploration required for auctioning a block based on the nature of the deposit.

These rules draw much of the definitions and codes from United Nations Framework Classification (UNFC) version-1997 and Committee for Mineral Reserves International Reporting Standards (CRIRSCO) Template. The definitions in these rules have been suitably modified to suit the requirement of Government of India. These rules provide the scientific basis to the exploration required for proving a mineral deposit.

Investigations on use of Low Lime industrial wastes for Carbon Capture and Utilization

There are several research works in the area of carbon sequestration, focused on the possibility of storing CO_2 in cement-based materials. Among these, low lime calcium silicate cement (CSC) has unique features such as a carbonation-hardening behavior, which allows sequestration and utilization of captured CO_2 gas. This study also envisages to develop Calcium silicate based cements (CSCs) using industrial byproducts. These CSCs are capable of hardening while capturing CO_2. Thus, it will prove beneficial in development of precast bodies along with promoting circular economy and CO_2 sequestration. The objective of this project is to use lime and silica bearing industrial/mining wastes like alkali by pass dust, low grade limestone/dolomitic limestone, phosphogypsum, silica fume, flyash/bottom ash, rice husk ash, etc to develop low lime calcium silicates/magnesium silicate phases capable of CO_2 capture. Accordingly, low lime industrial by products samples were collected from other industries and their chemico-mineralogical and microstructural analysis was carried out. Experimental design was set up for synthesis of calcium silicate phases like rankinite, larnite, akermanite, pseudowollastonite and wollastonite at 1200°C in laboratory furnace. Carbonation studies at 14% CO_2, 65% RH at ambient temperatures for 24 hours in progress.

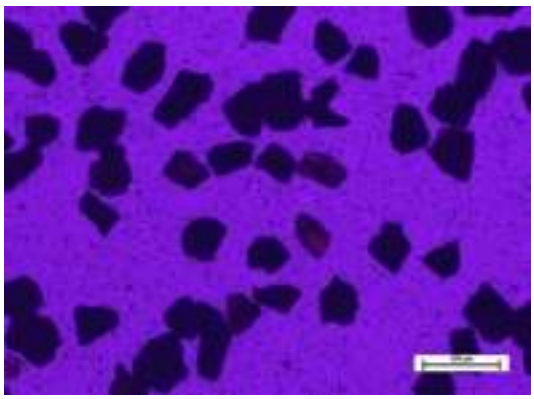
The XRD and TG/DTA analysis represented ~25% of calcite in the carbonated samples. The formation of calcite phase is accompanied with the consumption of majorly the rankanite phase in the clinker. The formation of ~25% calcite in clinker corresponds to appx. 12% CO_2 uptake in 24hrs in the prepared clinker nodules.



TG/DTA Thermograms of (A) Carbonated Clinker (B) Non Carbonated Clinker

Technical Suitability of utilization of Zinc slag generated from Zinc industries in manufacturing of cement (Phase-I)

In this project zinc fumar slag samples were provided by M/s Hindusthan Zinc Ltd, Rajasthan to study its technical suitability for utilization in manufacture of cement in Phase 1. The chemical analysis of zinc slag indicated abundance of Fe_2O_3 (46%) and of SiO_2 (23%). The leachability of barium, strontium, zinc and manganese was 10.78, 6.11, 77.15 and 97.92 ppm. The grindability index of fumer slag, FS was 16.3 Kwh/Ton. The results of slag activity index indicated that the 28 day slag activity index was 82.1%. Based on the above characterization studies on the zinc slag samples it may be considered for use as raw materials or as additive in cement. The studies on its utilization in cement manufacture is underway.



Optical micrograph of Zinc Slag Sample

Investigations on utilization of fly ash generated by co-firing of biomass in cement manufacturing

To tackle stubble burning issues and to reduce CO_2 emissions from coal based thermal power plants, Ministry of Power is promoting the use of Biomass. It has been mandated that all thermal power plants to use 5% blend of biomass pellets made, primarily, of agro-residue along with coal. Estimated availability of biomass in India is at about 750 million metric tons per year. Biomass is generally characterized by high moisture contents, lower heating values, and a variety of minor constituents, such as chlorine, alkalis, sulfur, phosphorus etc. Biomass when co-fired along with conventional fuels, the characteristics of biomass may affect the utilization potential of resultant ash by changing its overall composition. Therefore, while co-firing biomass in thermal power plants, there should be consideration of the effects of biomass on the properties of fly ash.

Biomass materials that can be used for power generation include bagasse, rice husk, straw, cotton stalk, coconut shells, soya husk, corncob, coffee waste, jute wastes, ground nut shells, saw dust etc. In the European context, co-combustion of biomass is extensively studied at laboratory, pilot plant and full plant scales. Pre-processing units for biomass help in preparation of uniform quality of feed. In case of biomass containing high heating values and low ash contents, its co firing did not show any significant effect on the resultant fly ash and it is effectively utilized in the civil engineering sector. However, biomass containing higher quantities of alkali, P, Cl and high ash content may cause corrosion problems in the system and the quality of the resultant fly ash will be affected significantly. Presence of alkali, Cl etc. also limits its usage in cement and concrete due to their potential alkali silica reactions and chloride induced corrosion in reinforced concrete structures. Ashes from biofuels may also contain heavy and toxic elements, depending on its sources. Therefore, NCB has taken up the studies on effect of co-firing of biomass on fly ash properties. The outcome of

the project will provide comprehensive database on physicochemical properties and quality of fly ash generated from biomass co-firing.

Picture showing (A) Fusion Bead preparation (B) Sample loading for XRF analysis

Investigation of Lump Formation in Cement Bags

NCB has successfully carried out investigations on Lumps in Cement Bags for cement plant which approached for study of the same. The plant was facing the problem of lump formation in cement bags within 10 to 15 days of dispatch. NCB carried out complete chemico-mineralogical analysis starting from the raw materials, intermediate products, and the finished product. All the process parameters along with the packing plant, transportation and the warehouse were thoroughly investigated. Based on the above studies recommendations were given and remedial measures and action plan was suggested. These recommendations and action plans have resulted in successfully solving the problem of lump formation in cement bags of the cement plant.

Technical Suitability of Post Metal Extraction Residue-I (Vanadium lean) & Post Metal Extraction Residue-II (Nickel lean) In Manufacturing of Cement

Studies were undertaken to evaluate the potential for utilizing Post Metal Extraction Residue-I (Vanadium lean) and Post Metal Extraction Residue-II (Nickel lean) in cement manufacturing. Based on chemical and mineralogical characterization:

Residue-I (Vanadium lean) exhibited high silica, alumina, and alkali content. This composition indicates that it may be technically suitable for use in Ordinary Portland Cement (OPC) both as a performance improver and as a raw material in clinker manufacturing. It has been considered appropriate for inclusion in the raw mix up to 3 percent, along with other raw materials, for manufacturing OPC conforming to the requirements specified in Indian Standard IS: 269-2015.

Residue-II (Nickel lean) was found to have high calcium and sulphate content, similar to mineral gypsum. This makes it a potential alternative to gypsum as a set retarder in cement manufacturing. However, due to its high sulphur content, it may not be suitable as a raw material for clinker production. It has been considered appropriate for use as an additive component along with mineral gypsum in cement production.

Technical Suitability of By-Product Chemical Gypsum as a Set Controller in the Manufacture of Cement for M/s J K Cement Limited, Gurugram

The study aimed to evaluate the chemical and physical characteristics of various chemical gypsum samples and their performance in cement blends. The clinker, fly ash, Mineral and chemical gypsum were characterized for chemical, mineralogical characteristics and leaching studies. Different blends of PPC were prepared by blending chemical gypsum samples with clinker in laboratory ball mill. The investigation shows performance of the different PPC cement blends prepared with the addition of clinker (55.5-62.5 percent), by-product chemical gypsum from 2.4-9.5 percent to yield PPC-Cement with a maximum set limit of 35 percent of fly-ash, as per Indian Standard IS: 1489-2015 (Part-1). The study highlighted chemical gypsum as a viable alternative to mineral gypsum in cement production to enhance sustainability as well as promoting circular economy.

Visit to plant for study on By-Product Chemical Gypsum as a Set Controller in Cement

LCF Study by NCB in M/s Heidelberg Cement Damah M.P.

Independent Testing

Independent Testing (INT) Laboratories of NCB undertake complete physical, chemical, mineralogical and microstructural analyses of various types of cement, clinker, raw materials, additives, pozzolana, aggregate, concrete, admixture, water, admixture, refractory, bricks, coal, petcoke, lignite etc. as per national and international standards. The INT laboratories established in 1977 on a Test House pattern, undertake testing jobs for BIS, cement, construction and allied industries. NCB testing laboratories achieved a landmark when NABL accredited them in the year 1997 as per ISO/ IEC 17025 quality system. The Independent Testing Laboratories are NABL accredited and also recognized by BIS. The quality of testing services is maintained through complying with system and accreditation criteria. The laboratories are equipped with state of art instruments to carry out the tests as per national and international standards. These labs also perform testing of internal samples for CRM and BND preparation, PT sample preparation and R&D/ SP projects. During the financial year, assignments were carried out for samples received from neighbouring countries also. The number of samples tested during the period was more than 7628.

Centre for Mining, Environment, Plant Engineering and Operation-(CME)

Centre for Mining, Environment, Plant Engineering and Operation carried out its activities through six Programmes viz. Process Optimization and Productivity; Energy Management; Project Engineering and System Design; Environment Sustainability & Climate Change; Advanced Fuel Technology, Geology, Mining & Raw Materials and Quality Assurance Group and completed 32 sponsored projects during the year.

Process Optimization and Productivity (PRP)

- **Heat balance & energy consumption optimization in cement kilns for M/s Kesoram Industries Ltd., unit - Vassvadatta Cement, Sedam, Karnataka**
  - Heat Balance study of Kiln by assessing the thermal performance of kiln system.
  - Formed recommendations for improving thermal energy performance of the kiln system. Report submitted.

- **Process study for optimization of Raw Mills Line 1 & 2 at M/s KCP Cement Ltd**
  - Carry out the internal inspection of mills including separator to identify causes for sub-optimal performance of the mills
  - Carry out the plant trails for improving productivity based on the observations.
  - Report submission on the above findings including recommendations for improving productivity of VRMs.

- **Study Heat and Gas/Air Balance and recommending corrective actions in pyro-system at M/s CCI Tandur, Telangana**
  - Heat Balance study of Kiln by assessing the thermal performance of kiln system.
  - Formed recommendations for improving thermal energy performance of the kiln system.

- **Investigations on lump formation in cement bags at M/s Nuvoco Vistas Corp. Ltd.: Haryana Cement Plant (HCP), Bhiwani, Haryana**

- **On-site measurements of Process Parameters across calciner & Preheater in a cement plant locating in Saudi Arabia for M/s Tridiagonal Solutions, Pune**
  - Carried out measurement of all parameters including gas / air flow rates, temperature, static pressure, Gas analysis (O_2, CO & CO_2), at appropriate locations through portable instruments

➢ **On-site measurements of Process Parameters at Raw mill, Preheater and Bag filter ducts in a cement plant locating in Saudi Arabia for M/s Tridiagonal Solutions, Pune**

- Carried out measurement of all parameters including gas/airflow rates, temperature, static pressure, Gas analysis (O_2, CO & CO_2), at appropriate locations through portable instruments

Measurements during audit study at M/s Nuvoco Vistas Corp Ltd, Bhiwani, Haryana

Energy Management (EMG)

NCB has been very closely associated with energy efficiency improvement of the Indian Cement Industry. NCB has an experienced team of Energy Engineers, Certified Energy Auditors and Accredited Energy Auditors certified by Bureau of Energy Efficiency (BEE, Govt of India) to conduct detailed energy audits. NCB has carried out more than 250 detailed energy audits till date in various cement plants. Energy audit studies in cement plants include assessment of energy management, monitoring and target setting, detailed heat balance and gas balance studies, identification of potential for thermal and electrical energy savings and recommendations for remedial measures, techno economic feasibility studies for waste heat recovery system (WHRS) etc. In the year 2024-25, the EMG programme has completed 16 Mandatory Energy Audit Studies and their details are given below:

➢ **Sponsored Projects Completed during the F.Y. 2024-25:**

S.No	Project Title	Sponsor	Identified Energy Saving Potential (TOE)
1	Mandatory Energy Audit	M/s Saurashtra Cement Ltd, Veraval, Gujarat. (IU)	18880
2	Mandatory Energy Audit	M/s Saurashtra Cement Ltd, Sidheegram, Gujarat (IU)	2617
3	Mandatory Energy Audit	M/s UTCL- Aditya Cement Works, Rajasthan. (IU)	16,953
4	Mandatory Energy Audit	M/s UTCL- Reddipalayam Cement, Tamil Nadu. Works (IU)	7443
5	Mandatory Energy Audit	M/s UTCL- Kotputli Cement Works, Rajasthan. (IU)	1585

S.No	Project Title	Sponsor	Identified Energy Saving Potential (TOE)
6	Mandatory Energy Audit	M/s UTCL- Vikram Cement Works, Madhya Pradesh. (IU)	9013
7	Mandatory Energy Audit	M/s UTCL- Rajashree Cement Works, Karnataka. (IU)	19363
8	Mandatory Energy Audit	M/s UTCL- Sarlanagar Cement Works, Karnataka. (IU)	45058
9	Mandatory Energy Audit	M/s UTCL- Narmada Cement Works, Gujarat. (IU)	2302
10	Mandatory Energy Audit	M/s UTCL- Roorkee Cement Works, Utara Khand (GU)	208
11	Mandatory Energy Audit	M/s UTCL- Bathinda Cement Works, Punjab (GU)	70
12	Mandatory Energy Audit	M/s UTCL- Bagheri Cement Works, Himachal Pradesh. (GU)	284
13	Mandatory Energy Audit	M/s UTCL- Patliputra Cement Works, Bihar (GU)	208
14	Mandatory Energy Audit	M/s UTCL- Sonarbangla Cement Works, West Bengal. (GU)	131
15	Mandatory Energy Audit	M/s UTCL- Wanakbori Cement Works, Gujarat. (GU)	1059
16	Mandatory Energy Audit	M/s ACC Ltd; Lakheri Cement Works, Rajasthan. (IU)	4457

BEE has awarded a sponsored project on details research study of solar thermal erngry application (for medium temperature application 150°C -400°C) in Indian Cement Industry.

During Measurement at a Cement Plant

With the cement plant team on conclusion day

Project Engineering & System Design (PSD)

➢ Sponsored Projects

- **Project Management Consultancy services for installationof 600 tpd Green Field Cement Plant Project at the Republic of Congo**
  For the Government of the Republic of Congo, NCB serving as a Project Management Consultant (PMC), Managing project implementation and helping with project supervision. Activities for setting up the cement plant at Louvakou district, Department of NIARI, Republic of Congo. Package-I (Mine development & Mining Equipment Supply) was successfully finished in the first week of November 2023. Package-II (Engineering, Construction and Supply of Cement plant) is under progress and expected to complete by December 2025.

Visit of a delegation comprising Officials of Govt of India and Govt of Congo

- **Vetting the Techno commercial Proposal from parties for RDF Char plant at M/s Malabar Cements Ltd, Kerala**
  M/s Malabar Cements Ltd. has awarded a project to carry out the technical study and evaluation of the technical proposal for installation of RDF to RDF Char plant at their cement plant at Walayar.

- **Preparation of a TEFR for a 3000 tpd cement plant for Berbera Cement, Somaliland**
  NCB in consortium with M/s GVS Consulting LLP, Rajasthan, is providing the consultancy services to Berbera Cement Factory for Preparation of TEFR for setting up a 3000 tpd green field cement plant at Somaliland

- **Design of an Alternative Fuel dryer for Cement plants by utilizing cooler ESP vent air**
  To enhance the utilization of waste as Alternative Fuels in Indian cement Industry, Bureau of Energy Efficiency has funded for the project for design and development of the Alternative Fuel dryer. Project will support to the Indian cement industry to enhance the TSR by reducing moisture content

- **Technical Study for Installation of Multi-Channel Multi Fuel Burner and Additional Bag Filter for Coal Mill at M/s Malabar Cements Ltd, Kerala**
  M/s Malabar Cements Ltd. has awarded a project to carry out the technical study of installing a new multi-channel multi fuel burner and additional bag filter for Coal Mill in their existing cement plant at Walayar, Kerala.

➢ R&D Projects

- **Development of Pre-combustion technology for AF burning and increasing TSR in Indian Cement Plants**
  To support the make in India scheme of GoI, NCB has undertaken an R&D project which will help to Indian Cement industry to replace the coal by waste utilization. The objective of this R&D project to develop cost effective indigenous product for Indian cement Industry to enhance the TSR.

Advanced Fuel Technology (AFT)

➢ Sponsored Project

- **Process design and integration of RDF/biomass gasification to cement plant calciner to enhance alternative fuel utilization in Indian cement industry**
  In order to reduce fossil fuel dependency, integration of an RDF/biomass gasifier in the existing cement plant is an emerging technique. NCB has applied for the above-mentioned project, which was sponsored by the Bureau of Energy Efficiency (BEE), Ministry of Power, Govt. of India. In the proposed gasification methodology, the feedstock is transformed into syngas rich in hydrogen (H_2) and carbon monoxide (CO) along with nitrogen, carbon dioxide (CO_2), and methane (CH_4). Syngas obtained from gasification has a heating value in the range of 5–7 MJ/Nm^3 that can be utilized for industrial purposes as a fuel. This project targets characterization of RDF samples, installation of a downdraft type gasifier with producer gas cleaning system at NCB, process modelling using Aspen Plus, conducting experiments at NCB-Ballabhgarh, techno-economic analysis. Proces modelling for integration of calcines will RDF gasification is being undertaken.

➢ R&D Projects

- **Electrification of cement calciner for carbon capture in cement industry**
  A R&D project was undertaken on electrifying the cement calciner for capturing carbon dioxide from the cement industry. To electrify the calciner, plasma heating technology was primarily targeted due to its advantageous behaviour compared to other methods. The prime focus of this R&D project is

to review the various available plasma heating technologies, interaction from the plasma experts, preliminary design selection for the electrification setup, procurement and fabrication of the lab scale setup, procurement of modeling software, conducting the experiments on the lab scale, modeling and techno-economic analysis, etc. Initially, a memorandum of understanding (MoU) between the National Council for Cement and Building Materials (NCB) and the Institute of Plasma Research (IPR) was signed to work together in the direction of electrification of calciner in the cement industry. A research article targeting the proposed concept was presented at the NCB's 18th International Conference, and Best Presentation Award was achieved. Further, experiment swere conducted at plasmo set up of DIBER (DRDO) for kish feed calcination different process configuration also explored for carbon capture using Aspen Plus Software.

- **Development of CO_2 emission factors and biogenic index of alternative fuels used in Indian Cement Industry**
  Rapidly increasing global CO_2 emissions in the environment area serious concern in the present scenario. The cement sector is one of the major sectors that contributes a significant amount of CO_2 emissions. The concept of the project is based on developing the carbon emission factors for the Indian cement industry. On focusing on the international norms, the actual CO_2 emitted from the Indian cement industry is actually being calculated. The calculated data will be helpful for the reduction in greenhouse gas emissionsby creating competition between the Indian cement industries for adopting alternative energy sources. This project covers literature survey for the emission factor of IPCC, CSI, etc., site visits for sample collection, sample preparation and outsourcing of sample testing, characterisation, determination of CO_2 emission factors and biogenic index for alternative fuels. It has been reported that around 143 alternative fuels types are being used in the Indian Cement Industries, and of these, 15 types of AF have been identified for further investigation. Apart from these samples, coal and pet-coke are also considered during the study.

Quality Assurance Group (Electrical & Mechanical)

The QAG program of CME provides end to end Third Party Quality Assurance solutions for MEP works in various types of establishments like Hospitals, Schools, Convention Centers, Street lighting works, Sewage Treatment Plant, Effluent treatment plant etc. The engineers attached to the program are well qualified and experienced in carrying out Pre-dispatch inspections of electrical and mechanical equipment/ items, reviewing & monitoring test reports of equipment/ materials and inspecting quality of workmanship during different phases of the project.

The program has contributed towards nation building by assuring quality in some of the iconic projects like Bharatmandapam, Yashobhoomi, AIIMS, New Delhi and Rishikesh, Defence Complexes/ Offices, New Delhi, Residential quarters of CPWD and DDA, STP projects of MCD etc.

➢ **Select list of reputed clients of the QAG program is given below:**

- Municipal Corporation of Delhi (MCD)
- Central Public Works Department (CPWD)
- National Industrial Corridor Development Programme (NICDC)
- India Trade Promotion Organisation (ITPO)
- All India Institute of Medical Sciences (AIIMS)
- Delhi Development Authority (DDA)
- Delhi Transport Corporation (DTC)
- Indian Institute of Technology, Roorkee (IIT-R)

Environment Sustainability and Climate Change (ESC)

➢ **Sponsored Projects**

- **Performance Assessment Study of Air Pollution Control Equipment (APCE)**
  Performance Assessment of Existing Air Pollution Control Equipment was taken up for a cement plant in Assam, under which the stacks of major APCE attached with Kiln/Raw Mill, Coal Mill, Cooler were monitored. Dust monitoring of inlet and outlet of APCE was carried out to evaluate the performance of APCE.

- **Water Footprint Assessment and Green House Gas (GHG) Assessment**
  GHG assessment was carried out for three years covering Scope I and Scope II emissions. Water Footprint Assessment carried out for three years based on the data provided by the plant.

➢ **R&D Project**

- **Development of Net Zero Technology Roadmap for Indian Cement and Concrete Sector**
  Under this project, comparative assessment of roadmaps developed for cement and concrete sector in different countries (USA, Australia, China, Germany, Vietnam, Turkiye, Cembureau, GCCA) has been prepared. Three sub-groups on cement, concrete and buildings were formed. A steering committee was formed to guide the project team.

Centre for Construction Development and Research-(CDR)

Centre for Construction Development and Research (CDR) is contributing immensely in the development of durable and sustainable civil infrastructure for the nation. The Centre provides services to the cement, concrete and construction sectors through four programs namely Concrete Technology (CON), Structural Optimization and Design (SOD), Structural Assessment and Rehabilitation (SAR) and Construction Technology and Management (CTM). The centre has State-of-the-Art facilities for mechanical, physical and durability testing of concrete and concrete making materials and Non -destructive testing of concrete through advanced equipment. The Centre completed 75 sponsored projects during the financial year 2024-2025.

Concrete Technology (CON)

A. Material Evaluation and Concrete Mix Designs

The physical and chemical characterization of concrete-making materials is a critical step in ensuring their suitability for use in concrete production. This process involves a comprehensive assessment of various materials such as cement, fly ash, silica fume, Ground Granulated Blast Furnace Slag (GGBS), water, fine aggregates, coarse aggregates, and chemical admixtures. Evaluating these properties helps in determining the optimal mix proportions to achieve concrete that is not only economical but also meets the required strength, durability, and workability standards. Various government/semi government/private organizations like NTPC and its subsidiaries, NHPC and its subsidiaries, NBCC, CPWD, PWD, BHEL, SJVN, IRCON, RLDA, ITD Cementation, UJVN Limited, L&T Limited, BG Shirke and other organization of repute approached NCB to study the performance of different concrete making materials and to provide recommendations for the required grade of concrete ranging from M10 to as high as M90. During the period of 2024-25, 22 sponsored projects of material characterization and about 50 mix designs were completed.

B. Concrete Mix Design for Special Applications

- **Design of Self-Compacting Concrete**

  Self-Compacting Concrete (SCC) of grades M30 to M40 were designed by NCB for BG Shirke and NBCC during the period of 2024-25.

- **Pavement Quality Concrete**

  Pavement Quality Concrete was designed by NCB for NTPC Lara, NTPC Farakka and BHEL during the period 2024-25

- **Design of Roller Compacted Concrete**

  Design of Roller Compacted Concrete is in progress using Portland Composite Cement & Portland Pozzolana Cement for NHPC Dibang during the period of 2024-25.

- **Design of Dry Lean Concrete**

  Dry Lean Concrete (DLC) was designed by NCB for BHEL, NTPC and CPWD during the period of 2024-25.

C. Alkali Aggregate Reaction (AAR) studies on aggregates

The presence of Alkali aggregate reaction (AAR) in concrete structures is a major concern for the construction industry. It is one of the leading causes of deterioration in concrete structures, second only to reinforcement corrosion. Alkali silica reaction (ASR) is a chemical reaction between the alkalies in Portland cement and certain siliceous aggregates, resulting in the formation of an expansive alkali silica gel. Alkali carbonate reaction (ACR) is the reaction of certain argillaceous carbonate rocks with hydroxyl ions in pore solution leading to the dissociation of dolomite (known as dedolomitization). NCB has developed expertise in evaluating aggregates for potential alkali aggregate reaction, including both ASR and ACR.

- **The following tests are carried out to evaluate the potential Alkali Aggregate Reactivity of aggregates:**
  - Petrographic and Mineralogical Analysis as per IS: 2386 Part VIII.
  - Accelerated Mortar Bar Test as per ASTM C1260.
  - Mortar bar test as per IS: 2386 Part VII.
  - Prism Bar Test as per ASTM C 1293 & ASTM C1105
  - Potential Alkali-Carbonate Rock Reaction Test by chemical composition (as per CSA A23.2-26a and ASTM C1778)

  About 16 number of coarse and fine aggregate samples were evaluated for petrographic and mineralogical analysis as per IS:2386 Part VIII, accelerated mortar bar test as per ASTM C1260 and mortar bar test as per IS: 2386 Part VII for various prestigious clients like NTPC, CPWD, BHEL, UJVNL, NHPC Ltd, L&T Ltd, etc. during the period of 2024-25.

D. Evaluation of Integral Crystalline Waterproofing compound

Integral Crystalline Waterproofing is an advanced technology designed to render concrete structures watertight by promoting the formation of microscopic crystals within the concrete matrix. The fundamental principle of this technology is to block the movement of water by filling and sealing the capillaries, micro-cracks, and pores naturally present in concrete. These crystals are formed when specific chemical compounds within the waterproofing admixture react with moisture and unhydrated cement particles, leading to the development of an insoluble crystalline structure.

Over the past decade, the National Council for Cement and Building Materials (NCB) has made significant strides in the area of Integral Crystalline Waterproofing (ICW), developing core competencies in the performance evaluation of these compounds. Through sustained research and collaboration, NCB's team of expert scientists and

engineers has been instrumental in creating a systematic approach for testing and assessing the efficacy of ICW products.

NCB has established robust mechanisms and protocols for evaluating the performance of integral crystalline waterproofing compounds in both concrete and mortar. These assessments are carried out using a range of standardized testing techniques and methodologies based on relevant Indian (e.g., IS standards) and international codes (such as ASTM, EN, and DIN).

This extensive evaluation framework enables NCB to provide scientifically validated recommendations for the selection and application of ICW products in various infrastructure projects, ensuring long-term performance and durability of concrete structures exposed to challenging environmental conditions.

- **The center has testing facilities to evaluate their performance in terms of the following parameters.**
  - Resistance against water penetration into concrete (cyclic loading and high hydrostatic pressure of 16 bar) as per IS: 516 (Part-2/ Sec1) and ACI 212.3R
  - Resistance against water penetration into mortar as per IS: 2645
  - Resistance against chloride ingress into concrete as per ASMT C 1202, NT build 492, SIA 262/1-B, ASTM C 1556
  - Resistance against CO2 ingress into concrete as per IS: 516 (Part2/ Sec4), ISO 1920 Part12, SIA 262/1-I
  - Determination of coefficient of permeability using Mercury intrusion porosimetry techniques and ASTM C 642
  - Utilization of Scanning electron microscopy (SEM) technique for determining the presence of integral crystals in concrete specimen

  NCB has evaluated performance of 4 numbers of crystalline water proofing compounds in various grades of concrete for clients like ITD Cementation India Ltd., CPWD, and Pidilite Industries limited in the financial year 2024-2025.

E. Evaluation of Bipolar Corrosion inhibiting admixture compound in concrete

Corrosion of embedded steel in concrete is an electrochemical process, which involves both anodic and cathodic reactions. In the anodic reaction, iron atoms in the reinforcing steel lose electrons, becoming iron ions. Simultaneously, at the cathodic sites, these free electrons are consumed, typically in reactions involving oxygen and moisture. The result is the formation of corrosion products (such as rust), which can lead to expansion, cracking, and eventual deterioration of the concrete structure.

Bipolar corrosion inhibiting admixtures are a class of chemical additives specifically formulated to combat corrosion in reinforced concrete structures. What sets these admixtures apart is their effectiveness at both the anodic and cathodic sites of the corrosion cell. By influencing both ends of the electrochemical reaction, they offer

more comprehensive protection compared to traditional inhibitors that typically target only one site.

The National Council for Cement and Building Materials (NCB) has developed expertise in evaluating the performance of bipolar corrosion inhibiting admixtures over the last 9-10 years. NCB assesses their performance using various testing techniques and methods based on Indian and international standards. Some of the parameters that NCB evaluates include:

- Immersion Test for 720 hrs. (Rebar weight loss method)
- Modified Accelerated Corrosion Test (Based on Japanese Standard JIS Z1535)
- Effect of Corrosion inhibiting admixture on fresh and hardened concrete.
- Polarization Test by Tafel Polarization with 3.5 % NaCl, for 20 days
- Effect of Corrosion inhibiting admixture in resisting chloride ion penetration as per AASTHO T259
- Effect of Corrosion inhibiting admixture in resisting chloride ion penetration as per ASTM C1202
- Long Term Corrosion Test as per G-109

NCB has evaluated performance of 05 numbers of Corrosion inhibiting admixtures in various grades of concrete for various industrial clients like Laal chemicals, Apple Chemie India Private Limited, CERA Chem Pvt. Ltd., Tata Projects Limited in the financial year 2024-2025

F. Hydraulic Abrasion Resistance Test as per ASTM C1138

ASTM C1138 is a standard abrasion test method designed to assess the relative abrasion resistance of concrete surfaces exposed to water movement in hydraulic structures. The test involves subjecting a concrete disc specimen immersed under water to a specified abrasive charge rotated at a certain speed and measuring the depth of wear of the specimen after a specified duration. NCB has carried out such studies for M/s Fosroc Chemicals India Pvt. Ltd. in the financial year 2024-2025. The test apparatus used for the underwater abrasion test according to ASTM C1138 requirements is shown in Fig.

The test disc specimen and the steel balls

ASTM C1138 abrasion testing machine.

G. Some of the Important Completed R&D and sponsored Projects

➢ Completed R&D Project

- **Utilization of CO_2 in Fresh Concrete and Study on Fresh and Hardened Properties of CO_2-Induced Concrete**

In the area of Carbon Capture and Utilization (CCU), NCB took up the R&D Project titled "Utilization of CO_2 in Fresh Concrete and Study on Fresh and Hardened Properties of CO_2 induced Concrete". The project aimed to study the potential of CO_2 Utilization in concrete and its effect on fresh and hardened properties of concrete. Accelerated carbonation of the cementitious phases of concrete is much more viable to contribute in the short term to mitigation of climate change than natural carbonation. Research included not only the carbonation processes but also the properties of CO_2 induced Concrete in terms of fresh properties, concrete mix design, mechanical properties, and durability. The brief objective of the study was as follows: (a) Optimization of mix-design (b) Study of fresh properties of CO_2 Induced concrete (c) Study of Mechanical properties of CO_2 induced concrete and (d) Study of Durability parameters of CO_2 induced concrete. The experimental setup prepared for injecting CO_2 in fresh concrete is shown in Fig.

1(a)

1(b)

(a) & 1(b): An experimental setup prepared for injecting CO_2 in fresh concrete

In this R&D project, twelve mixes optimized at water binder ratio 0.45 and 0.30 for three cementitious systems (OPC and OPC+25% Fly ash) with and without CO_2 was used. Fresh, Mechanical and Durability properties of 12 mixes was studied to determine effect of CO_2 injection in fresh concrete. The Fresh Properties results i.e., workability and air content of concrete at water-binder ratio - 0.45 & 0.30 are shown in Figures 2a & 2b and 3a & 3b are given below:

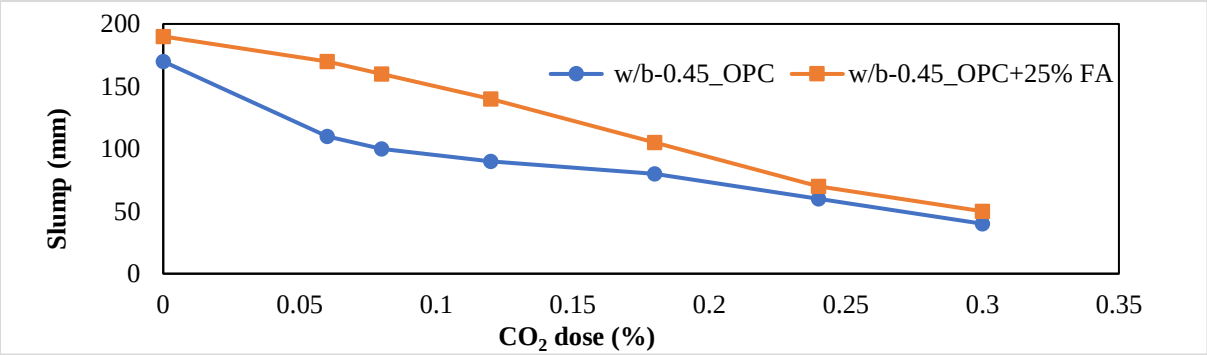


Fig 2a: Workability of concrete mixes with different CO_2 doses at w/b 0.45 for OPC & OPC+25% fly ash

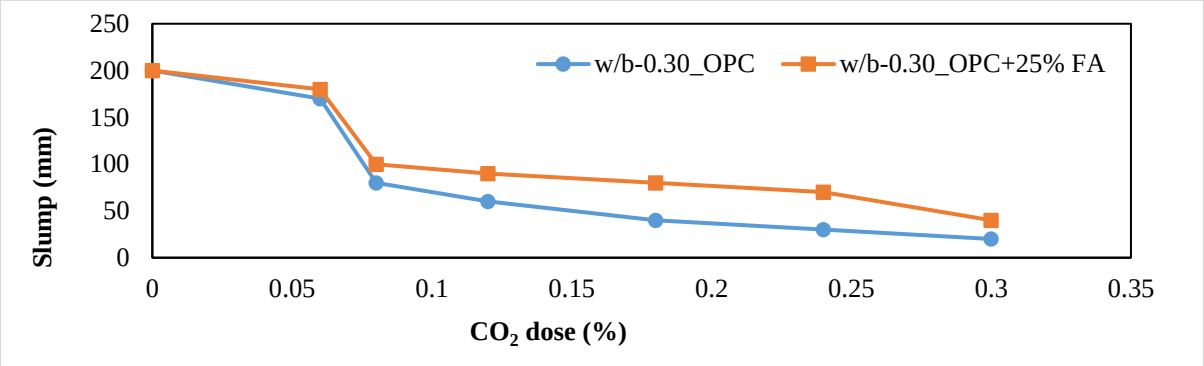


Fig 2b: Workability of concrete mixes with different CO_2 doses at w/b 0.30 for OPC & OPC+25% fly ash

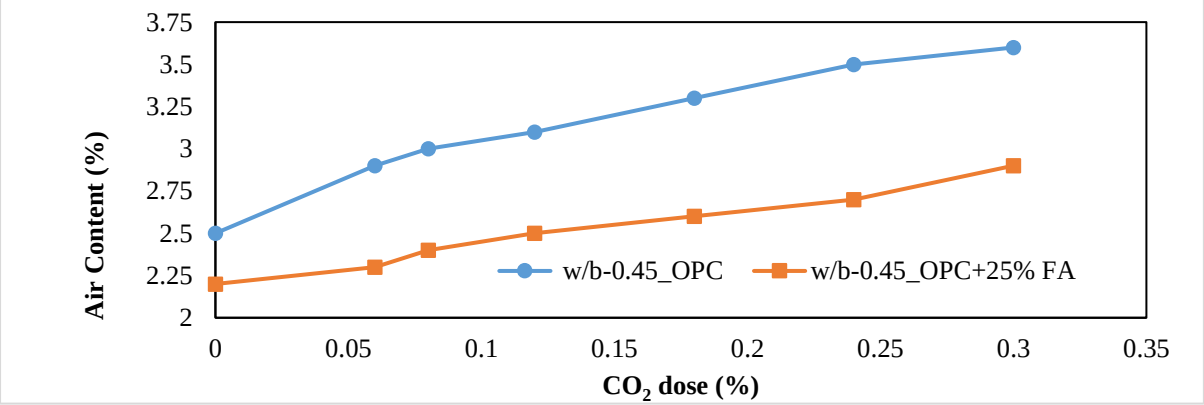


Fig 3a: Air content of fresh concrete mixes with different CO_2 doses at w/b 0.45 for OPC & OPC+25% fly ash

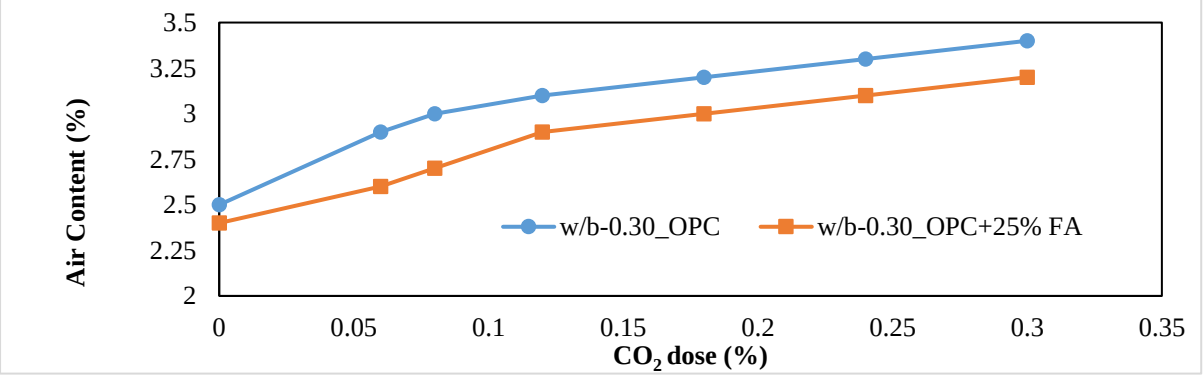


Fig 3b: Air content of fresh concrete mixes with different CO_2 doses at w/b 0.30 for OPC & OPC+25% fly ash

✓ *The key findings of the studies are as follows:*

- Slump decreases with increasing CO_2 dose; high doses of CO_2 make concrete unworkable.
- Early-age strength (3-day) improves in CO_2 induced concrete for both OPC and PPC, but gains reduce with prolonged curing at 7 to 28 days.
- Flexural strength, modulus of elasticity, split tensile strength, and drying shrinkage are comparable between CO_2 and non-CO_2 induced mixes.
- In case of higher dose of CO_2 at 0.12% some reduction in compressive strength is observed.
- Water permeability, carbonation depth, and RCPT results are comparable for CO_2 and non-CO_2 mixes at same w/b and binder type.
- CO_2 uptake decreases with lower w/b ratios due to accelerating effect of CO_2 in fresh state.
- The potential of CO_2 sequestration through the mixing route has been found to be less than 0.5%.

➢ **Completed Sponsored Projects:**

- **Evaluation of concrete making materials and concrete mix design for concrete of grades M10, M15, M20, M25, M30, M35, M40, M50, & M90 with different brands of cement.**

  In these studies, the concrete, making materials such as cement, aggregate, etc., were evaluated for various physical and chemical properties. Samples of various concrete making constituents were evaluated for various properties as per the relevant Indian Standards. Based upon the evaluations, recommendations regarding suitability of raw materials for making concrete were given. Following the confirmation of raw material suitability, concrete mix designs were done for a wide range of concrete grades, including M10, M15, M20, M25, M30, M35, M40, M50, and M90. The mix designs were formulated in accordance with standard practices to achieve the desired workability, strength, and durability for different structural applications. Final recommendations on optimal mix proportions were then proposed for each grade to ensure performance consistency and material efficiency.

  NCB carried out 22 Sponsored Projects and about 50 concrete mix designs in the financial 2024-2025 for reputed clients like NTPC and its subsidiaries, NHPC and its subsidiaries, NBCC, CPWD, PWD, BHEL, SJVN, IRCON, RLDA, ITD Cementation, UJVN Limited, L&T Limited & BG Shirke.

- **Permeability Characteristics of Bipolar Corrosion Inhibitor Admixture "CORROSTOP-15" in Concrete**

  NCB has carried out the performance evaluation study of Bipolar Corrosion Inhibitor Admixture CORROSTOP-15 in concrete for M/s Lal Chemicals. To study the effect on the permeability characteristics of the concrete (M30 and M35 grade of concrete) following tests were carried out on concrete mixes made with and without CORROSTOP-15 at the dosage provided by the sponsor. The following tests were carried out for the performance evaluation study:

  ✓ Rate of water absorption or sorptivity test as per ASTM C 1585

  ✓ Volume of permeable voids, bulk density, water absorption (after immersion) as per ASTM C 642

  ✓ Water permeability test as per IS 516 Part 2/Sec 1

- ***Performance Evaluation of E5® Internal Cure admixture in concrete***

  NCB has carried out the performance evaluation study of E5® Internal Cure admixture in concrete for M/s H.R Organo Chem Pvt. Ltd. The internal curing admixture /compound was tested for various fresh, mechanical and durability properties of the concrete. The durability aspects of use of internal curing compound on various concrete properties has also been studied.

- ***Testing of Roller Compacted Concrete (RCC) Core samples for Ratle HE Project (J &K).***

  In this study, a total of 41 roller-compacted concrete (RCC) core samples were evaluated to determine key mechanical and durability-related properties for M/s Megha Engineering and NHPC. Specifically, the following tests were conducted:

  - Compressive Strength, in accordance with IS 516 (Part 4)
  - Coefficient of Water Permeability, as per the procedure outlined in IS 3085

  These tests were carried out to assess the overall quality, strength, and durability of the RCC used in the project. The compressive strength test helps determine the compressive load-bearing capacity of the concrete, while the water permeability test provides insight into the concrete's resistance to water ingress, which is critical for durability in hydraulic and structural applications.

  This evaluation forms an important part of the quality assurance process, ensuring that the RCC meets the performance requirements for its intended use in the structure.

H. Some of the on-going R&D and sponsored projects

➢ Ongoing R&D Project

- **Mechanical and Durability Performance of CO_2 sequestered sintered ash lightweight aggregate in concrete**

The proposed research project aims to develop an eco-friendly, sustainable alternative to natural aggregates in concrete by utilizing legacy ash from thermal power plants. Specifically, the study focuses on creating lightweight aggregate (LWA) through sintering ash and sequestering CO_2 via mineral carbonation. This process not only addresses environmental concerns related to CO_2 emissions and ash disposal but also contributes to the production of durable, lightweight concrete suitable for structural applications.

✓ Objectives

The project is centered around three core objectives:

1. Development of sintered ash lightweight aggregate capable of sequestering CO_2.
2. Detailed characterization of the physical, chemical, and mineralogical properties of the aggregate.
3. Comprehensive evaluation of fresh, mechanical, and durability properties of concrete incorporating the CO_2-sequestered aggregate.

♦ Rationale and Significance

India has an estimated 1,734 million tonnes of legacy fly ash, alongside millions of tonnes of carbide sludge, which offers a high potential for mineral carbonation due to its high calcium oxide content. The current global market trend supports the growth of lightweight aggregate concrete, expected to reach USD 60.33 billion by 2027. However, limited data exists on the performance and CO_2 sequestration potential of sintered-based lightweight aggregates, making this research timely and necessary.

♦ Methodology

The study will be executed in two primary stages:

1. Stage 1: Production of the lightweight aggregate using a pelletization and sintering process, followed by mineral carbonation using a CO_2 chamber. The optimal raw mix and carbonation parameters (e.g., temperature, humidity, CO_2 concentration, pressure) will be identified to maximize CO_2 uptake.

2. Stage 2: Characterization of the produced aggregates and comparative analysis of concrete made with and without Sintered ash light weight aggregate at two water-cement ratios (0.40 and 0.60).

✓ **Concrete will be assessed for:**

1. Fresh Properties: Workability, air content.
2. Mechanical Properties: Compressive strength, tensile strength (split and flexural), elastic modulus, drying shrinkage.
3. Durability Parameters: RCPT, chloride migration, water sorptivity, carbonation resistance, concrete resistivity, alkali-silica reactivity (ASR), and sulphate resistance.

✓ **Expected Outcomes**

1. Development of a viable alternative to natural aggregates using industrial by-products.
2. Establishment of optimal parameters for production and carbonation of aggregates.
3. Empirical data on the structural performance and durability of concrete incorporating CO_2-sequestered LWA.
4. Contribution to sustainable construction practices by reducing the carbon footprint and repurposing industrial waste.

This research will bridge a critical gap in sustainable construction by advancing the technology of CO_2 sequestration in concrete materials. By innovatively using waste products to create high-performance building materials, the project aims to set a benchmark for eco-friendly infrastructure development in India and potentially worldwide.

➢ **Ongoing Sponsored Projects**

- **Evaluation of concrete making materials, Mix design trials of Roller Compacted Concrete and semi–adiabatic test of selected concrete mixes.**

Roller-compacted concrete (RCC) has been used in dam construction since the late 1970s. This concrete has zero-slump consistency and is placed and compacted with equipment typical of earth-moving or paving operations. The use of RCC usually results in a shorter construction schedule due to higher production rates compared to conventional or mass concrete construction. A shorter construction schedule minimizes the hydrologic

risks involved with dam construction and allows the contractor to reduce contingency costs for potential flood damages.

In this regard, NCB has taken up the sponsored project titled "Evaluation of concrete making materials, Mix design trials of Roller Compacted Concrete and Semi–adiabatic test of selected concrete mixes for NHPC." The project aims to test the suitability of concrete-making materials such as cement, natural coarse aggregate, fine aggregate (Natural/Crushed), Fly ash, etc. as per the requirement of relevant Indian Standards and to perform the mix design trials for roller compacted concrete using the tested concrete making materials.

Many trials with specified requirements of vee-bee time have been conducted with PPC and composite cement. Hardened properties such as modulus of elasticity, poissons ratio, direct tensile strength, compressive strength at various ages have been evaluated. Setting time of selected mixes has been evaluated by adjusting the dosages of retarder.

Further, a Semi-Adiabatic test will be conducted on 03-04 nos. selected concrete mixes. Under this study, a rise in temperature under close to adiabatic condition will be studied using thermocouples installed in 4 different layers as per the testing protocol designed for the study. This study and evaluation will be useful from the point of view of limiting the thermal gradients inside the concrete which is of critical importance in mass concrete structures.

- **Testing of Roller Compacted Concrete (RCC) Cylindrical Core samples for Ratle HE Project FST-II (J &K).**

As part of the quality assessment for the Ratle Hydroelectric (HE) Project – FST-II, a total of 28 roller-compacted concrete (RCC) core samples are being subjected to a comprehensive evaluation to determine their mechanical properties. The tests which are being conducted include:

i. Compressive Strength, (IS 516 -Part 4)

ii. Direct Tensile Strength, (CRD-C 164)

iii. Modulus of Elasticity and Poisson's Ratio in Compression, (IS 516 -Part 8/Section 1 or ASTM C469)

iv. Modulus of Elasticity in Tension (CRD-C 166)

This testing program is designed to ensure that the RCC used in the project meets the specified performance criteria and structural requirements essential for the safe and durable operation of the hydropower infrastructure. The project is currently under progress.

✓ **Performance evaluation of Bipolar corrosion inhibitor admixtures in concrete.**

NCB has been carrying out the performance evaluation study of bipolar corrosion inhibiting admixtures such as in concrete in the financial year 2024-2025, NCB has taken up such evaluation for M/s Pidilite Industrial Ltd, Concrete Additives & Chemicals Pvt Ltd, Sunanda Chemicals etc. which are currently underway. To study the effect of these bipolar corrosion inhibiting admixtures in concrete (M20 to M50 grade of concrete) tests are being carried on concrete mixes made with and without the given bipolar corrosion inhibiting admixtures at the dosage provided by the sponsor.

To evaluate the effectiveness of corrosion inhibiting admixtures in concrete, both short-term and long-term tests are conducted. Short-term tests include a 720-hour Immersion Test (rebar weight loss method), Modified Accelerated Corrosion Test (JIS Z1535), and evaluation of concrete workability, strength, and durability. Electrochemical testing includes the Tafel Polarization Test in 3.5% NaCl over 20 days to assess corrosion activity and inhibitor efficiency. Chloride ion penetration resistance is evaluated using AASHTO T259 and ASTM C1202 (RCPT). For long-term performance, the ASTM G109 test monitors corrosion of embedded steel under chloride exposure, providing insight into the durability of the admixtures.

Performance assessment studies related to all these tests are currently in progress, and the results will help to determine the suitability and effectiveness of these admixtures in improving the durability and lifespan of reinforced concrete structures.

- ✓ **Tests on Coefficient of Linear Thermal Expansion & near to adiabatic Temperature rise test of identified concrete mixes and test for Heat of Hydration (at ages of 3days, 7 days, & 28 days) for various cement and blended cement samples.**

National Council for Cement and Building Materials (NCB) has taken up this project for M/s Song Da–Kalika Joint Venture (A joint venture of M/s Song da Corporation, Vietnam and M/s Kalika, Nepal). As part of the study, NCB is carrying out the following tests:

i. Heat of hydration tests of cement and blended cement (cement + flyash) samples at various ages.

ii. Determination of coefficient of linear thermal expansion.

iii. Near to adiabatic temperature rise test.

The near to adiabatic temperature rise test is aimed at assessing the temperature development due to hydration in mass concrete conditions, which is critical for understanding potential thermal cracking behaviour. NCB has designed its own test set up for carrying out this test.

These evaluations are essential for ensuring the suitability of the selected cementitious materials and mix designs for use in mass concrete applications under the specific conditions of the project.

✓ **Concrete Mix Designs and Test for Coefficient of Thermal Expansion & Mechanical tests of Mass Concrete (with 2 brands of cement) for SJVN Ltd.**

National Council for Cement and Building Materials (NCB) has conducted mass concrete mix design trials for various concrete grades. Following the mix design, a series of mechanical and physical properties are being evaluated on concrete specimens prepared in accordance with the specific requirements of each relevant test method. The properties being assessed include:

i. Compressive Strength,
ii. Density of Hardened Concrete,
iii. Split Tensile Strength,
iv. Static Modulus of Elasticity, and
v. Coefficient of Thermal Expansion.

These tests are being performed at various ages to understand the time-dependent behaviour of the concrete and to ensure compliance with the performance criteria required for large-scale mass concrete applications.

✓ **Performance evaluation of Integral Crystalline Admixture (Fosroc Conplast Crystalline) at two dosages and estimation of optimum dosage of integral crystalline admixture in M40 grade concrete (for given mix design)**

NCB is evaluating the performance of integral crystalline admixture products in M40 grade concrete, at two different dosages for M/s ITD Cementitious Ltd. Concrete specimens are being prepared with and without the addition of crystalline admixture, following the same mix design providing by the sponsor.

To assess the effectiveness of the crystalline admixtures, the following tests were carried out:

i. Compatibility performance test
ii. Water penetration depth under 16 bar hydrostatic pressure
iii. Chloride and alkali content in the crystalline admixture
iv. Resistance to Alkali-Silica Reactivity (ASR)
v. Chloride diffusion coefficient using the NT Build 492 test method

vi. Water penetration depth after four cycles of 5 bar hydrostatic pressure

vii. Reduction in water permeability compared to control (non-admixed) specimens

These tests will help in determining how well the integral crystalline admixtures improve durability and reduce permeability in concrete and also help determine the optimum dosage of the product for the given mix design.

✓ **Performance evaluation of Integral Crystalline in M40 grade concrete (for given mix design) at specified dosage for CPWD Dwarka Division, NACP, Okha, Gujrat.**

The National Council for Cement and Building Materials (NCB) is currently conducting a detailed performance evaluation of two types of concrete waterproofing products:

i. Integral Crystalline Admixtures, and

ii. Integral Crystalline Coatings.

These products are being tested in M40 grade concrete at specified dosage levels. To carry out this evaluation, concrete specimens of M40 grade are being cast as follows:

- ✓ One set of specimens cast with the addition of the integral crystalline admixture & Integral crystalline coating at the specified dosage.
- ✓ Another set cast without the admixture/coating to serve as control samples.

The purpose of this study is to understand how the inclusion of these crystalline products affects the overall properties of the concrete, especially in terms of durability, waterproofing, and resistance to environmental effects.

In order to test the performance of the integral crystalline admixtures/coatings, samples are being tested for parameters such as:

- ✓ Compatibility Performance Test
- ✓ Water Penetration Depth under 16 bar hydrostatic pressure
- ✓ Chloride and Alkali Content in the crystalline admixture
- ✓ Performance Against ASR (Alkali-Silica Reactivity)
- ✓ Chloride Diffusion Coefficient (NT Build 492 method)
- ✓ Water Penetration Depth after 4 cycles of 5 bar hydrostatic pressure

- ✓ Reduction in Water Permeability Coefficient compared to control specimens
- ✓ Abrasion Resistance of the treated concrete surface

Structural Optimization & Design (SOD)

Effect of Fire on the Residual Mechanical Properties of reinforcing bars and Structural Performance of Reinforced Concrete Beams in flexure & Shear

RC structure is widely used in the construction industry, and its exposure to fire is a great concern. Fire exposure may degrade the steel and concrete reinforcement in RC beams, reducing their ductility, stiffness, and strength. Because concrete with steel reinforcement is one of the most utilised materials for construction, the performance of reinforced concrete structures in fire demands special consideration. The study of the impact of fire on reinforced concrete (RC) structures is crucial, as it directly affects the safety and integrity of buildings during and after a fire event. Fire resistance of concrete structures is mainly dependent on the cover. Spalling of this concrete cover can occur at temperatures as low as 250-300°C, which exposes the reinforcing steel bars to direct fire. There have been various experiments on the concrete properties at elevated temperatures, but there is limited data on indigenous steel rebars manufactured by different manufacturers in India. To study the effect of fire on reinforcing bars, a ring test was conducted on primary and secondary steel brands from various manufacturers to assess the uniformity of the tempered martensite ring in TMT bars. Primary bars showed a continuous, concentric, and uniformly thick peripheral tempered martensite ring, while secondary bars showed a discontinuous and non-uniform tempered martensite ring. The bars were tested at elevated temperatures of 500°C, 750°C, and 1000°C for different soaking periods of 30, 60, 120, and 240 minutes to study residual mechanical properties. For both primary and secondary brands of TMT reinforcing bars, 500°C was found as the threshold temperature up to which no significant changes or reduction is observed in tensile strength, yield strength, and percentage elongation. Where a member is required to have fire resistance against Penetration of Flames and Heat Transmission, the nominal cover should be increased to prevent the main bars from premature spalling of the concrete cover. The values depend on the fire rating required in the structural members as well as on the number of surfaces of the member that are exposed to fire.

The focus is on evaluating the flexural and shear performance of Reinforced Concrete (RC) beams post-exposure to elevated temperatures on limited samples. It covers the flexural and shear design of RC beams of two grades of concrete, casting of RC beams, exposure of cast RC beams to fire, and subsequent testing for flexure and shear performance of RC beams. A total 12 numbers of thermocouples have been fixed in each beam. The K-type

Thermocouple

thermocouple, which was used is shown in Figure. The working range of the Thermocouple is 1400°C.

The beam is insulated from the top by ceramic wool with fire resistance up to 1400 °c as shown in Figure. The eight beams, four in flexure and four in shear, is tested one by one in the furnace as per standard fire curve of IS 3809-2017.

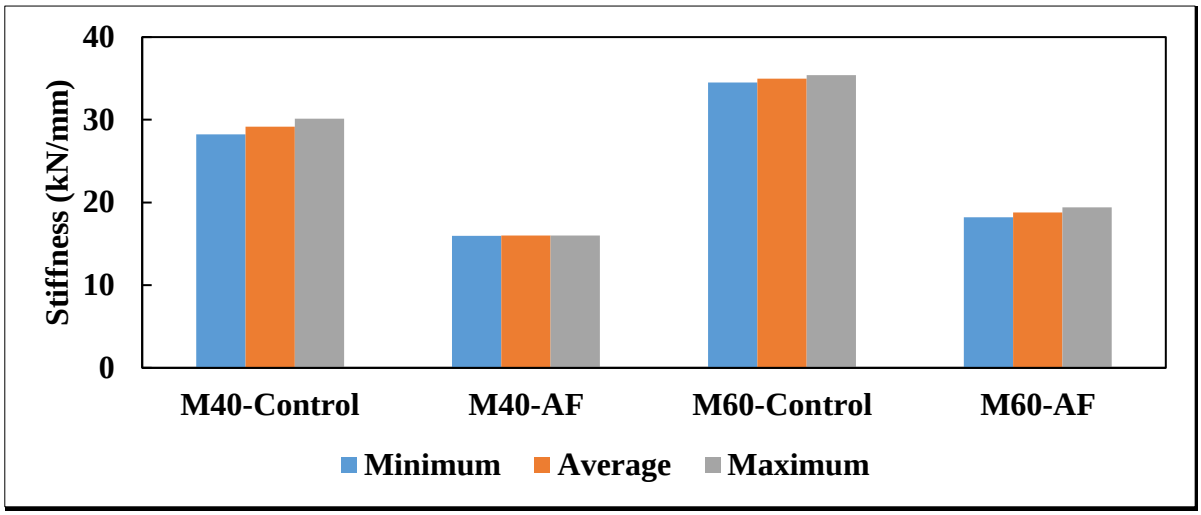
Instrumentation details of the beam supported on the furnace

Recorded temperature, strain, load and deflection data are analyzed for comparison to results for beams exposed to ambient conditions and fire. The flexural and shear capacities of these beams related to concrete grade and fire risk was calculated. The failure modes of the beams have been investigated to correlate with the observed crack patterns and material properties.

Test set up for testing of beam in four-point bend test

A total of 8 control samples (beams without fire exposure) are tested at ambient temperature for load carrying capacity. The four-point bend test was conducted on beams using a flexural testing machine of capacity 500 kN as shown in Figure.

The failure mode of the shear beam in the four-point bend test is same for the control beam and fire fire-exposed beam. The shear capacity of the fire-exposed M40 beam was reduced by 35% and 42% for M60 concrete beams as compared to the control beams. Fire exposure leads to a reduction in the effective modulus of elasticity of the beam, resulting in a decrease in its stiffness. The stiffness of the fire-exposed beam is reduced compared to the control beam in both grades of concrete. The maximum reduction in stiffness of the fire-exposed M40 beam is 36%, while in the M60 beam, it is 55% compared to the control beam. The flexural moment-carrying capacity of the fire-exposed M40 beam was reduced by 7% and 13%, whereas this reduction was 36% and 43% for M60 concrete beams.



Stiffness of beams in shear before and after exposure to fire

The M40 beam is showing discontinuous (localized) spalling from the edges of the beams, longitudinal cracks & minor flexural cracks. However, M60 beam shows continuous spalling from the edges of the beams & minor flexural cracks. The M60 concrete has lower permeability as comparatively to M40 concrete. This is because, M60 has a denser microstructure due to lower water-cement ratios and silica fume as additives.

Beam	Figure	Remarks
Shear M40		Major cracks in the longitudinal direction Have a weight loss of 18-19% after fire exposure.
Shear M60		Spalling in concrete is observed with having weight loss of 6 & 10%

Structural Assessment & Rehabilitation (SAR)

Under the umbrella of Structural Assessment and Rehabilitation Program, a wide range of activities related to assessment of new and existing concrete structures are carried out. These involve:

- Condition assessment of existing concrete structures including fire damaged concrete structures.
- Investigation of material properties of hydraulic structures such as Dams.
- Load Testing of RCC structures like bridges, underground RCC conduits, buildings, etc.
- Application of Non-Destructive Testing for conformity of quality and condition assessment of concrete structures.
- Preparation of repair estimates including cost estimates and detailed schedule of items for repair and rehabilitation works.
- Consultancy services involving quality inspection and third-party quality assurance of repair and rehabilitation works of concrete structures
- Research & Development Projects on modern repair technologies.

A. Condition Assessment & Non-Destructive Testing

In-service structures, especially commercial, industrial and residential buildings, bridges, tunnels, dams, high-rise buildings, etc. require periodical assessment to ascertain whether they can perform satisfactorily for the intended service life. The distress in any form, such as cracks, spalling of concrete, corrosion of reinforcement, seepage, etc., not only disturbs the aesthetic appearance but also reduces the safety and integrity of the structures under use. For condition assessment of structures, investigations are done to figure out the root cause of distress and formulate effective strategies for repair & rehabilitation along with strengthening if required. The investigation process involves elaborate preliminary site inspection of distressed structure (visual survey, background Histrory and photographic records) and condition assessment usinging non-destructive evaluation techniques and collection of in-situ samples for further processing & testing at laboratory.

SAR program is well supported by a state-of-the-art non-destructive testing laboratory that has adequate facilities for carrying out Non-Destructive Testing and evaluation of concrete structures. The Non-Destructive Testing Lab has NABL accreditation and ISO 17025: 2017 certified test facilities for Ultrasonic Pulse Velocity Testing and Rebound Hammer Testing of Hardened Concrete. Besides this, the lab also has facilities for evaluation of other parameters such as Surface Electrical Resistivity of Concrete using Four-Point Wenner Probe method, Evaluation of Air Permeability of Cover Concrete using Torrent Air Permeability Tester, Pull-Off Tester to assess the adhesion of repair materials bonded to concrete substrates, Half-Cell Potential Test to assess the corrosion condition of embedded rebars, Electromagnetic rebar and concrete cover detector, concrete core extraction kits with high quality

diamond concrete core bits of various diameters, portable crack width measurement microscope & DFT meter. UAV aided Infrared thermography camera can be helpful in accessing the tall RCC structures. All these facilities are made use of extensively in non-destructive tests on new concrete structures for quality assessment as well as in condition assessment works of existing and aged structures. Besides this NCB also has facilities for chemical analysis (for evaluation of pH, Chlorides, Sulphates etc.) of hardened concrete samples collected from the site and testing of reinforcement bars. Corrosion of embedded reinforcement bars is the most widespread cause of the deterioration of reinforced concrete structures. NCB specializes in assessment of corrosion damaged reinforced concrete structures and providing cost effective solutions for their repair and rehabilitation. NCB also has adequate experience and testing infrastructure to carry out assessment of fire damaged structures. State of the art testing techniques such as Mercury Intrusion Porosimetry (MIP), Differential Thermal & Thermo-Gravimetric analysis (TG-DTA), X-Ray Diffraction (XRD) Analysis, Scanning Electron Microscopy (SEM) Imaging with elemental analysis, etc., are made use of in microstructural analysis of concrete from time to time to assess material properties of concrete in various kinds of structures like dams, bridges, etc. and also to assess the extent of fire damage and provide cost effective solutions for repair of damage caused due to fire.

Some of the photographs of the SAR projects monitored by NCB

Left: UPV testing done on Chimney at BHEL Kahalgaon, Bihar

Right: Various Testing done on IDCT Cooling Tower at the NTPC Kahalgaon, Bihar

Left: Teesta- V Dam Site for Non-Destructive site visit

Right: Teesta Low Dam-III Preliminary inspection site

- **Preparation of detailed estimates for repair and rehabilitation works including detailed item specifications**

  SAR program offers services for preparation of detailed repair estimates including detailed item specifications for repair and rehabilitation works. This is done based upon the detailed condition assessment report on the subject structures. The detailed repair estimates are also supported by rate analysis of the non-schedule repair items.

- **Consultancy services of repair and rehabilitation works of concrete structures**

  SAR program offers consultancy services for quality inspection and quality assurance of ongoing repair and rehabilitation works. Sampling and testing of repair materials is done for source approval as well as intermediate quality checks on the input materials. Non-destructive tests are done at site for post repair quality inspection of repaired areas. On-site inspections are carried out during execution of repair and technical guidance is provided for effective implementation of repair methodology as per specifications.

B. R&D Projects

- **Completed R&D Project**

- Evaluation of Concrete Surface Coatings for their effectiveness in service life enhancement of RCC elements

- **Objective:** To formulate guidelines based on experimental studies on the efficacy of different types of concrete surface coatings in enhancing the service life of RC elements.

  Expected Benefits

  - Formulation of guidelines for the use and selection of concrete surface coatings for inclusion in BIS publications and other Indian Standards.
  - Evaluation of different concrete surface coatings w.r.t their efficacy and durability under different exposure conditions.
  - Evaluation of service life enhancement under different exposure conditions for different concrete surface coatings available in India.
  - Recommendations for enhanced service life of reinforced concrete structures using surface coatings.

  A wide variety of concrete surface coatings are available in the market, making the selection of the most suitable type a challenging task. The performance of these coatings largely depends on the nature and severity of exposure, the common prevailing environmental conditions in India are either carbonation induced corrosion environment or chloride induced corrosion environment. However, limited information is available on the effectiveness of coatings

commonly used in these environments in India. Therefore, there is a pressing need to establish region-specific guidelines for selecting coatings suitable for the exposure conditions typical of India.

As per BS EN 1504 Part-2, the protective surface treatments for Reinforced Concrete are done by combination of following methods.

- Hydrophobic Impregnations (Hi)
- Impregnations (I)
- Coating (C)

Identification of Available Generic Surface Protective Systems in the Market:

Based on the literature survey, it is envisaged to carry out the experimental study on following four types of coatings:

- Acrylic resin
- Cementitious Polymer Modified
- Epoxy resin
- Polyurethane resin

Hydrophobic Impregnation:

- Silane Siloxane

Impregnation:

- Methyle Methacrylate

Based on the exposure condition and principle of protection, following and methodology is adopted as given in Table below.

Exposure Condition	Principle	Adopted Method of Protection	Types of Surface Treatments
Chloride Ingress	Protection against Ingress	Hydrophobic Impregnation + Impregnation + Coating	• Acrylic resin (C) • Cementitious Polymer Modified (C) • Epoxy resin (C) • Polyurethane resin (C) • Silane Siloxane (HI) • Methyl Methacrylate (I)
Chloride Admixed	Moisture Control	Hydrophobic Impregnation + Coating	
Carbonation	Protection against Ingress	Hydrophobic Impregnation + Impregnation + Coating	

A concrete mix with a OPC 43 grade cement content of 300 kg/m3 and effective water to cement ratio of 0.6 was utilized for the concrete specimens. Coarse aggregate constituted 60 percent of the total aggregate and the rest was crushed

fine aggregate (sand). The details of shape and size of concrete samples used for performance testing are given below.

Property	Specimen Shape and Size of Specimen
Depth of Water Penetration	Concrete cylinder 150mm dia and 100mm length
Adhesion by pull-off test	Concrete Slab 350mm X 250mm X 100mm
Chemical Resistance	Concrete cylinder 60mm dia and 120mm length
Diffusion of Chloride	Concrete cylinder 100mm dia and 50mm length
Accelerated Carbonation Test	Concrete Slab 350mmX250mmX100mm
Dry Film Thickness	Concrete Slab 350mm X 250mm X 100mm
Relative Humidity in concrete	Concrete Slab 350mm X 250mm X 100mm

Prepared/coated concrete cylindrical samples of dia 100mm and 150mm before testing.

Splited concrete cylindrical samples of dia 150mm after water penetration testing as per IS 516: Part2/Sec1: 2018.

Coated concrete samples of dia 50mm after pull-off testing as per ASTM-C1583:2020

Application of coating material on concrete slab samples by brush.

Testing of relative humidity in the coated concrete slabs as per ASTM F2170.

Accelerated carbonation testing being done on coated concrete slabs as per IS 516: Part2/Sec4: 2021.

Air Permeability Testing being done on coated concrete slab specimen

NT Build 492 Testing being done on coated concrete specimen

Coated concrete cylinder specimen being broken into two half for Depth of Water Penetration measurement

Pull-off adhesion test being done on coated concrete specimen

- **Results and Conclusion:**

pH value as per IS 9103 :1999

The pH value of tested coatings is lying in the range of 6 to 9, except cementitious polymer modified coatings which have higher pH value around 12 due to presence of cement content.

Solid Content as per IS 101 Part-8 Sec-6: 1993

Solid Content of different coatings (polymer component) varies from 18.58% to 99.58%. The overall results shown variation in solid content amongst different types of coating is as EP>ACR>PU>CPMC. Provided that Part-B of CPMC is 100% solid content, in other coating Part A & Part B both are liquids.

Ash Content as per IS 9103 :1999

Ash content in various coatings varies from 0.08% to 93.79% and it is highest in case of CPM coatings due to the presence of cement/polymer content in powder form. In remaining coatings such as PU, ACR and EP, the overall ash content is varying from 20% to 50%.

Specific Gravity as per IS 9103 :1999

The specific gravity of various coatings varies from 0.98 to 1.55.

Chloride Content as per IS 9103 :1999

The overall values of chloride content in various coatings varies from 0.01 % to 0.093%, which indicates that chloride content is low, which is desirable.

Dry Film Thickness as per ISO 2808

The ultrasonic method based probes are suitable for DFT measurement on coated concrete. In the current study, initially WFT gauge was used, however, due to small surface area of coated samples, method was not found suitable. For testing of Dry Film Thickness (DFT), digital eddy current based DFT meter was used on pre-installed steel coins on the concrete specimens.

Bond test / Adhesion by pull-off test as per ASTM-C1583:2020

Bond Strength of various coatings is varying as from 0.76 N/mm2 to 1.51 N/mm2. The overall results indicate that the bond strength results vary as PU > EP> ACR> CPMC. Bond Strength of Polyurethane, Epoxy & Acrylic coating is better than the Cementitious Polymer Modified coatings.

Chemical Resistance as per ASTM C267: 2001

Based on the results of compressive strength, it is inferred that w.r.t. Control Sample percentage reduction in strength of concrete cores is varying as PU>ACR >CPMC>EP that means Epoxy coating is more chemical resistant under highly alkaline environment than Polyurethane, Acrylic and Cementitious Polymer modified coatings.

Non Steady State Chloride Migration Coefficient as per NT Build 492

Observation w.r.t. Control Sample indicate that the % reduction is varying as EP(78%)>PU (67%)>CPMC (37%)>ACR(27%). The Epoxy coating and Polyurethane coatings have better chloride ingress resistance in comparison of Acrylic coating and Cementitious Polymer Modified Coating.

Moisture content inside the concrete as per ASTM F2170: 2019

The results indicate that Polyurethane coatings and Epoxy coatings are better than acrylic coating and cementitious coating.

Liquid Water Permeability Test as per EN 1062-3:2008

Based on the overall test results it can be concluded that the Liquid water permeability of Polyurethane and Acrylic coatings is less than the Epoxy coating and Cementitious coatings.

Depth of Water Penetration as per IS 516: Part2/Sec1: 2018

The overall water permeability results show that the Polyurethane coatings, Epoxy Coating and Cementitious Polymer Modified Coatings have better water penetration resistance than the Acrylic Coatings.

Air Permeability Test as per SIA 262/1

The overall air permeability test results indicate that the Acrylic coating and Polyurethane coatings are less permeable than the cementitious polymer modified coatings. Epoxy coating is least breathable amongst the all four tested coatings.

Accelerated Carbonation Test as per IS 516: Part2/Sec4: 2021

Based on the test results, it can be inferred that, Acrylic coatings, Epoxy Coatings and Polyurethane coatings have better anti-carbonation effect than compared with cementitious polymer modified coatings.

- **Cost Benefit Analysis:**

The cost of PU coating seemingly low because the coverage rate is high. In case of higher DFT is required, then the coverage will reduce and cost will increase proportionally. The exorbitant cost of the CPM coating could be attributed to its seemingly low coverage rate, which depends on the dry film thickness of the coating.

Material cost and the performance of selected coatings:

Coating Sample Id	Rate, Rs/m²	Performance Rating
ACR-1	49	85
ACR-2	61	83
ACR-3	55	70
ACR-4	86	60
EP-1	99	88
EP-2	61	92
EP-3	95	90
PU-1	48	92
PU-2	54	80
PU-3	58	80
CPM-2	108	63
CPM-3	122	63
CPM-4	134	50
CPM-5	183	55

- **Criteria for Selection of Concrete Coating:**

Based on the results of this study, the recommended values of various parameters of Identification tests and Performance tests for selection of concrete coatings are given below. However, it is recommended to test the

selected coatings, particularly under the expected exposure conditions, prior to their selection. This would assure that the coating could last for the period it is designed for.

Identification Test	Threshold Values
pH Value	6 to 9
Ash Content	<50%
Solid Content	>70%
Chloride Content	<0.02
Specific Gravity	>1

Exposure Condition	Test for Performance Evaluation	Recommended Values
Chloride Ingress	Depth of Water Penetration as per IS 516:Part-2:Sec1:2018	<25 mm
	Diffusion of Chloride as per NT Build 492	<25 m^2/sec
	Liquid Water Permeability as per EN 1062-3	<0.22 Kg/m^2/√t
	Adhesion by pull-off test by ASTM-D7234 2012	>1.5 MPa
	Air Permeability Coefficient (kT)	>0.1 KT in 10^-16 m^2
Chloride Admixed	Depth of Water Penetration as per IS 516:Part-2:Sec1:2018	<25 mm
	Liquid Water Permeability as per EN 1062-3	<0.22 Kg/m^2/√t
	Adhesion by pull-off test by ASTM-D7234 2012	>1.5 MPa
	Concrete Internal Humidity as per ASTM F2170	<75%
	Air Permeability Coefficient (kT)	>0.1 KT in 10^-16 m^2
Carbonation	Depth of Water Penetration as per IS 516:Part-2:Sec1:2018	<25 mm
	Carbon Dioxide Diffusion Coefficient	<0.9 mm/√days
	Liquid Water Permeability as per EN 1062-3	<0.22 Kg/m^2/√t
	Adhesion by pull-off test by ASTM-D7234 2012	>1.5 MPa
	Air Permeability Coefficient (kT)	>0.1 KT in 10^-16 m^2

Sponsored Projects Undertaken

NCB carried out a large number of sponsored project works involving structural health and condition assessment of concrete structures, Non-Destructive Testing of concrete structures, quality assurance services of ongoing repair work in the year 2024-2025. Our clientele included reputed Organizations like NTPC, PGCIL, NHPC, NHAI, RBI, BHEL, GAIL, NBCC, AIIMS, CPWD, DDA (New Delhi), IPGCL, MCD, BSES, WBPDCL, THDC & APCPL. 41 sponsored projects were completed during the year 2024-2025. Some of the major projects executed during the year 2024-2025 are listed below:

- Random Quality Inspection during execution of repair work of distressed RCC members of Residential Accommodation for NHAI at Dwarka.
- Condition Assessment of RBI quarters at Ravindra Nagar and Sarojini Nagar, New Delhi.
- Condition Assessment for recommendations on Maintenance and upkeep of various RCC Structures at NTPC Korba, Chhattisgarh.
- Condition Assessment for recommendation on Maintenance and repair of various RCC Structures at NTPC Kahalgaon, Bihar.
- Condition Assessment of RCC Chimney at APCPL, Jharli-Jhajjar, Haryana.
- Condition Assessment of CGST Tax Pool Qtrs. 78 Nos. at DDA Flats, Kalkaji, New Delhi.
- Condition Assessment of structures of Income Tax Pool Quarters 100 nos. at DDA Flats, Kalkaji, New Delhi.
- Condition Assessment of RCC structures of Lady Harding Hospital's Kalawati Saran Children's Hospital, New Delhi.
- Condition Assessment of HUDCO Flats at AGV, New Delhi.
- Condition Assessment of Kendriya Vidyalaya School building at Sector-2, R K Puram, New Delhi.
- Carrying out Concrete Core Extraction and Testing at 765/400 kV Narela GIS Substation at Village Mungeshpur, Delhi.
- Condition Assessment of New block, SDMC Primary School, Molarband, New Delhi.
- Condition Assessment of Residential Quarters of Type-B (14 nos.), Type-C (4 nos.), Type-D (1 no), Transit Camp and Recreation Centre at PGCIL 400/220kv Ballabgarh Substation, Near Samaypur, Faridabad.
- Carrying out Core Test and UPV Test of M35 grade concrete of RCC chimney (Unit-7) Shell at Stage-II, 3X500 MW NTPC Kahalgaon Super Thermal Power Station.

- Condition Assessment of Academic Block/College Building at Kirori Mal College, University of Delhi.
- Condition Assessment of Regional Agmark Laboratory (RAL), Okhla, New Delhi.
- Carrying out Ultrasonic Pulse Velocity (UPV) Testing of Various structures of Unit#2 & Unit#3 of 3x660 MW North Karanpura STPP Jharkhand.
- Condition Assessment of Residential Quarters of Type-B (17no.), Type-C (5no.), Type-D (1nos), Recreation Center (1nos) & Transit Camp (1nos) at PGCIL 400/220kv Bassi Substation Damodarpura, Bassi, Distt-Jaipur.
- Condition Assessment of Residential Quarters of Type-B2 (8 nos.), Type-B3 (8 nos.), Type-C (8 nos.) Type-D (1 no.) at PGCIL 400/220kv Bahadurgarh Substation –Jhajjar.
- Condition Assessment of Type-III buildings at Minto Road Complex, New Delhi.
- Carrying out Concrete Core Extraction and Testing at Fatehgarh-III Substation construction project Powergrid Ramgarh Transmission Limited at Teh. - Fatehgarh, Jaisalmer, Rajasthan.
- Condition assessment of RCC structures of the Buildings at ICAR, Krishi Vihar, New Delhi.
- Condition assessment of (G+4 storied) Guest House Building ILI at Bhagwan Daas Road, New Delhi
- Condition Assessment at Emaar Gururam Green Project at Sector-102, Dhankot Village, Gurugram (Dwarka Expressway) Haryana.
- Condition Assessment of TG Decks of Unit#1 & Unit#2 of stage-1 at NTPC Lara, Raigarh, Chhattisgarh.
- Carrying out testing of TG Decks of 03 Units (3x800 MW) of NTPC Kudgi STPP, StageI, Vijayapura District, Karnataka.
- Condition Assessment of Cooling Tower-Gear Box Supporting Structures at NTPC Faridabad Gas Power Station.
- Carrying out Non-Destructive Tests on Dam structure located at Dikchu site of Teesta-V Power Station situated on Teesta river in Gangtok District, Sikkim

Some of the photographs of the project sites and the site assessment work done by NCB team in various projects are given below:

Project site of Condition Assessment of RCC NDCT Cooling Tower of APCPL Jhajjar

Concrete Core Extraction from the Dam Top Location of Teesta-V Dam

Continuity testing being done after installation of Zinc anodes at site of NHAI Residential Enclave at Dwarka, New Delhi

UPV Test on TG Deck Slab at NTPC Kudgi, Karnataka.

Concrete Core Extraction from the Dam Gallery Location of Teesta-V Dam

Measurement of existing rebar diameter of an RCC member at a Building site in APCPL, Jhajjar

Carbonation depth being measured on freshly extracted concrete core at a Teesta-V Dam

Electrical Resistivity Measured on TG Column at NTPC, Korba

Half Cell Potential Measured Column at NTPC, Korba

Depth of RCC Slab measured with the digital Vernier caliper

Construction Technology and Management (CTM)

Third-Party Quality Assurance and Audit Services for construction projects

National Council for Cement and Building Materials (NCB) provides Third Party Quality Assurance and Audit consultancy for a wide range of construction projects such as multistoried residential buildings, commercial complex, school buildings, convention centers, Exhibition halls, flyovers, elevated corridor, dams, barrage, concrete roads, ROB & RUB, bridges and tunnels, construction utility projects, office building , hospitals buildings , special construction activities like pre-engineered steel structures, etc., built by the various central / state /PSU/ autonomous organizations across India through the NCB units located at Ballabhgarh, Hyderabad, Ahmedabad and Bhubaneswar. NCB uses state-of-the-art techniques / methods to perform inspections that reduces risk and ensures quality of construction. NCB provides its clients with independent and impartial services that enable them to timely identify, manage and reduce risk in quality of construction. Consultancy is given in form of transparent and unbiased inspection, testing and verification of remedial measures undertaken during construction so that customers can achieve assurance in their products, processes, systems and services.

The scope of Third Party Quality Assurance / Audit includes inspections, lifting and testing of samples, witness of field and laboratory testing done at site / fabrication yard, review of quality system and documents including Non-Destructive Testing (NDT) wherever applicable. NCB devices proper plan of quality audit of input materials, checks on plants & machinery, workmanship during various stages of construction and finished products. The inspections of works are carried out at different stages to check the quality of construction and its compliance to drawing, design, technical requirements, specification and contract conditions. Regular check on quality of materials and its compliance with the specifications are done through random sampling & testing of materials as per relevant standards and specifications. The activities involve random checking of steel reinforcement, fresh concrete properties at batching plant, placing & curing of concrete, soil / sub base compaction, finishing work like painting & tiles fixing, external development work etc. Inspection of Pre-engineered sections at fabrication yard / factory are done at

specified frequency to check quality of production. Inspection of batch mix plant / RMC plant are frequently done to ensure calibrations and effective production process during concrete mix preparation as per approved mix design. Necessary advice in form of quality assurance measures for quality improvement are provided during inspection. NCB provides necessary technical support during the progress as well as completion of work and gives its recommendations with respect to the discrepancies found at time of inspection including the corrective measures / remedies so that discrepancies can be rectified or re-done. Review & audit for regular quality control is also covered under the scope for which all the test reports, RMC batch mix printouts, Manufacture's Test Certificates (MTC), test register of input materials etc. are made available by the department at site for review. Periodical audit report (generally every week/ fortnightly / monthly) are submitted containing details of work / activities inspected, observations on inspections, construction methodology, material testing, quality assurance measures, review of quality system and NDT. However, major non-conformances observed and also for non-conforming materials, intimation are given during site inspection itself for immediate compliance. The material testing under Third Party checking generally varies from project to project as per agreed terms and conditions. The testing for special items like concrete pipes, DG sets, bearings, pre-stressing wires, pre-engineered sections, etc., are randomly witnessed jointly at manufacturer's production unit.

Prestigious projects of national importance have been awarded to NCB by Indian Trade Promotion Organization, India International Convention Centre, Central Public Works Department (CPWD), State PWDs, All India Institute of Medical Sciences (AIIMS), Delhi & Rishikesh, Development Authority (DDA), Uttrakhand Jal Vidyut Nigam Limited, Municipal Corporation of Delhi (MCD), Lala Lajpat Rai University of Veterinary and Animal Sciences (LUVAS), Odisha Industrial Infrastructure Development Corporation (IDCO), State Trade Promotion Organization's in Karnataka & Tamilnadu, Sports Authority of Gujrat (SAG), etc. The centre continues to provide specialized services in the area of quality assurance/control and thereby contributing to the durable, sustainable and quality infrastructure in India.

Some of the photographs of the TPQA projects monitored by NCB

General pool Residential Accommodation at Kasturba Nagar, Delhi

Waiting Halls, AIIMS Delhi

Residential Quarter for SSB at Faridabad

Chemistry Block at IIT-Roorkee.

Yashobhoomi ,IICC Dwarka.

Bharat Mandapam & exhibition halls, ITPO

AIIMS, Rishikesh

ROB/RUB at Sultanpuri, Delhi

Demonstration of Demo Structure for Ambient-Cured Geopolymer Concrete for Sustainable Construction

Cement production is a major contributor to global carbon emissions, accounting for nearly 7–8% of total CO_2 emissions worldwide. The manufacturing of one tonne of ordinary Portland cement (OPC) releases approximately 0.6 tonnes of CO_2 into the atmosphere. With the growing demand for environmentally sustainable construction materials, there is increasing interest in alkali-activated binders—particularly geopolymer concrete—as a low-carbon alternative to traditional OPC-based concrete. Geopolymer concrete (GPC) is synthesized through the polymerization of aluminosilicate materials in the presence of alkaline activators, significantly reducing carbon emissions. In this context, the National Council for Cement and Building Materials (NCB) developed an optimized geopolymer mix using ground granulated blast furnace slag (GGBS) and fly ash in a 70:30 ratios. Sodium hydroxide (NaOH) and sodium silicate (Na_2SiO_3) served as the alkaline activators. This mix presents an eco-friendly, sustainable substitute for conventional OPC concrete. The mix was first evaluated under laboratory conditions for its mechanical and durability properties. To bridge the gap between laboratory research and field application, the developed GPC mix was produced in a commercial ready-mix concrete (RMC) plant and used to cast a full-scale, single-storey demonstration structure with a plinth area of approximately 90 m^2. The batching was carried out in a fully automated plant equipped with dedicated silos for GGBS and fly ash, and a dual-drum system for preparing and cooling the activator solution. Transit mixers delivered the concrete to the site, maintaining a slump of around 150 mm without any signs of segregation or bleeding. The optimized mix achieved a compressive strength of 50 MPa at 28 days under ambient-curing conditions, outperforming the OPC control mix. On-site quality control measures included slump testing, temperature monitoring, and casting of cube specimens for compressive strength verification. The concrete exhibited sharp, well-defined surfaces with no breakage, efflorescence, or leaching. For performance validation, the structure was instrumented with strain gauges and dial gauges to monitor load and deformation. A full-scale load test was conducted by gradually applying 1.25 times the live load (8.1 tonnes) on the slabs. Load-deflection response at critical locations was predominantly elastic, with over 91% recovery post-unloading and maximum deflections well within the permissible limits specified by IS 456:2000. Strain measurements from both embedded and surface gauges showed a linear strain distribution with 96–98% recovery, aligning with the bending theory of solids, which assumes linear variation of strain with depth from the neutral axis. This confirmed the elastic behavior of the structure. Structural design based on the limit state method (IS 456:2000) proved to be reliable for geopolymer concrete under static loading conditions. Due to the hazardous and highly corrosive nature of the alkaline activators used in GPC, utmost care was taken during handling and production. All safety procedures outlined in IS 17452:2020 were strictly followed for chemical handling, batching, mixing, transport, and placement operations. The process also complied with other relevant BIS codes including IS 3812, IS 16714, IS 383, IS 456, IS 1786, IS 4925, and IS 4926. This project successfully demonstrates the feasibility of producing and deploying ambient-cured geopolymer concrete in commercial RMC operations. The structural performance of GPC was validated through comprehensive full-scale

testing, making a strong case for its practical implementation in real-world applications. The results represent a significant advancement toward mainstreaming low-carbon concrete technologies, with substantial potential to reduce CO_2 emissions and promote the utilization of industrial by-products.

Arrangement of hoppers and silos in the batching plant

Placement of dial gauges below slab and beams for recording deflections during load test

Laboratory Facilities

The followings are the laboratory facilities available in CDR centre to support the R&D and Sponsored Projects

(i) Mechanical & Physical Properties Investigation (MPI)

(ii) Non-destructive Testing (NDT)

(i) Mechanical and Physical Properties Investigation (MPI) Laboratory

Mechanical and Physical Investigation (MPI) laboratory is the part of center for Construction development and research (CDR). It is an NABL accredited testing laboratory in accordance with the ISO/IEC 17025:2017 procedures in the field of mechanical investigation (Test Certificate No.-5296) of construction materials. The Lab has structured quality management system (QMS) and conducts frequent internal and external assessments to ensure consistent reliable laboratory results. Further MPI Lab also involve in homogeneity testing of Standard Reference Material (SRM) such as Bharatiya Nirdeshak Dravyas (BND's) for various cementitious materials.

This lab has wide range of specialized testing facilities for conducting R&D studies. Laboratory has various state of the art facilities for the study of hardened concrete for various mechanical, durability and time-dependent properties.

State of the art facilities

- Chloride Ion Penetrability Testing Equipment
- Corrosion Rate Analyzer
- Strain Controlled Universal Testing Machine – 1000kN
- Strain Controlled Compression Testing Machine-3000kN along with Flexural Testing Machine-300kN.

- Crack Monitoring of Reinforced Concrete Beams.
- Determination of Toughness and Energy Absorption of Steel Fibre Reinforced Concrete and Shotcrete Panels.
- Determination of Modulus of elasticity and Poisson ratio of Concrete
- Mercury Intrusion Porosimetry Equipment
- BET Apparatus for Surface Area Determination
- Tri-axial Shear Strength of Concrete-500kN
- Temperature studies in concrete through thermocouples and Resistance Temperature Device and their recording in Data Loggers having multiple channels.
- Water Permeability Testing Equipment
- Study on Carbonation induced concrete by keeping concrete samples in carbonation chambers.
- Study on Long term sustained loading on concrete samples in Creep testing machine
- Study on corrosion studies using Electrochemical Impedance spectroscopy (EIS) equipment

New Facilities Created during the Financial Year

- Strain controlled Universal Testing Machine with extensometer for measurement of deformation in steel rebar samples.
- Strain controlled Compression Testing Machine-3000kN with flexural frame of 100kN.
- Rapid Chloride Penetrability Testing System with provision of chloride migration coefficient test.

MPI activities

- Mechanical Testing of Building Materials such as Hydraulic Cement, Aggregates, Fly Ash, Bricks, Steel Bar, Ceramic Tiles, Vitrified Tiles, Cement Concrete Flooring Tiles, Autoclaved Aerated Blocks, Corrosion Inhibitor, Fresh Concrete, epoxy, latex & Hardened Concrete.
- Determination of Alkali Aggregate Reactivity: Alkali Silica Reactivity & Alkali Carbonate Reactivity.
- Admixture Testing.
- Concrete Mix Design.
- Soil Testing includes Grading, Optimum Moisture Content, CBR Test, Liquid Limit & Plastic Limit Test.
- Fineness of cementitious and pozzolanic materials such as microfine OPC, ultrafine GGBFS, silica fume etc. by BET apparatus, etc.

- Steel fiber testing

1. **Mechanical Tests**

    - Modulus of elasticity and Poisson's ratio
    - Toughness and Energy absorption on steel fibre reinforced concrete.
    - Stress-strain characteristics
    - Fracture behaviour of beam
    - Drying Shrinkage of concrete
    - Dry and wet abrasion of concrete
    - Confined compression of concrete and rock
    - Creep and fatigue test on concrete.
    - Checking the behaviour of reinforced concrete by testing of beams and columns

2. **Durability tests based upon transport mechanisms and other tests**

    - Migration/ Conduction: RCPT, NT Build 492, Florida method
    - Diffusion: chloride diffusion/ ponding, accelerated carbonation (Laboratory as well as field study)
    - Penetration: permeability, volume of permeable voids
    - Microstructure: mercury intrusion porosimetery
    - Chloride induced corrosion: polarizing resistance as per ASTM G3, LPR, EIS
    - Ingress of sulphate: sulphate immersion test, mass loss test
    - Various other corrosion related test such as long term chloride induced corrosion test for admixture as per ASTM G109/ ASTM C1582.

3. **Analytical Equipment's for microstructural studies**

    - Particle Size Diffraction Analyzer. (0.04µm-2500µm)
    - Mercury Intrusion Porosimeter (0.004µm- 10µm)
    - BET Apparatus

Apart from the testing of construction materials, laboratory has also provided demonstration and training to various groups from esteemed organization such as Public Works department (PWD), Gujarat Engineering Research Institute (GERI), Department of Irrigation, NHPC, DMRC, NTPC etc., and recognized cement industry and also to many recognized academic institutions under various training programs.

Discussion on Mechanical Properties of Concrete

Water penetration testing of concrete

Demonstration of Water Permeability Test of Concrete to Trainees

Rapid Chloride Ion Penetration Test of Concrete (RCPT)

Strain Controlled Flexural Testing Machine for determination of flexural toughness of concrete

Mercury Intrusion Porosimeter

Under water Abrasion on Hardened Concrete

Hardened Concrete Sample -Accelerated Carbonation

Surface Area determination of cementitous Materials through BET apparatus

Hardened Concrete Sample- Creep Testing

Particles Size Distribution (PSD)

Demonstration of various test and facilities to the trainees of Gujarat Engineering Research Institute (GERI)

(ii) Non-Destructive Testing (NDT)

Non-Destructive Testing laboratory is equipped with latest state-of-art Non-Destructive testing equipments. The laboratory has NABL accreditation as per ISO 17025-2017 for UPV Testing and Rebound Hammer testing. The laboratory serves as a platform in the Centre for Construction Development and Research for providing services related to non-destructive testing and condition assessment of concrete structures in various sponsored and R&D projects. The laboratory has skilled

technicians and analysts who are trained on regular basis to ensure safety during testing and to deliver accurate processed outputs. All the instruments and devices are regularly calibrated with frequent intermediate performance checks to ensure quality of the test results.

Apart from providing testing and inspection services, the lab has arranged laboratory demonstrations as part of training programs for officials from various esteemed organisations like NTPC, HPCL, PWD, NHPC, BHEL, GERI etc.

The laboratory has following equipment's and facilities:

- Ultrasonic Pulse Velocity (UPV) Tester for estimating quality of concrete, crack depth, etc.
- Schmidt Rebound Hammers (L-Type, P-Type, N-Type & M-Type) for comparative assessment and obtaining indicative measure of the compressive strength of concrete.
- Half Cell Potential Measurement (Cu-CuSO4 based) for assessing the corrosion status of reinforcement bars embedded in concrete.
- Electromagnetic concrete Cover Meter for locating reinforcement bars and measuring concrete cover depth
- Concrete Core extraction kits with diamond core bits of various diameters (25mm, 60mm, 75mm, 100mm, 120mm, 300mm) for cutting and extracting concrete core specimens from RCC structures.
- Electrical Resistivity meter based on Wenner 4-probe method.
- Concrete Air permeability tester.
- Crack width measurement by portable crack width measurement microscope
- Digital Pull-Off tester for testing adhesion strength of repair materials to concrete substrates.
- Coating thickness meter.
- Carbonation of depth measurement of existing concrete structures.
- CO_2 Analyser.
- Unmanned Aerial Vehicle (drone) with optical and IR camera for inspection and condition evaluation of tall structures like chimneys, cooling towers, etc.

UPV Tester

Rebound Hammer

Half Cell Potential Measurement Kit

Concrete Cover Meter

Concrete Core Extraction Kit

Electrical Resisitivity Tester

Air Permeability Test Kit

Pull Off Tester

Dry Film Thickness Meter

Portable Crack Width Observer

Unmanned Aerial Vehicle (Drone)

Centre for Quality Management, Standards and Calibration Services–(CQC)

The activities of the Centre for Quality Management, Standards and Calibration Services are organized under four programmes: Standard Reference Materials, Calibration Services, Interlaboratory Services and Total Quality Management. These activities address all aspects of Quality Management and provide the entire range of Standardization and Calibration services to cement industry, R&D institutions, Concrete and allied building materials laboratories in India and abroad.

Standard Reference Materials (SRM)

NCB's SRM programme is accredited under ISO 17034:2016 as Reference Material Producers. NCB has developed Certified Reference Materials (CRMs) in the areas of cement, building materials and solid fuels (coal and pet coke). NCB's CRMs have been quoted in IS 4031(Part-2), IS 4031(Part-15) and IS 1727.

23 Bhartiya Nirdeshak Dravyas (BNDs), the Indian Certified Reference Materials (CRMs) were developed in collaboration with CSIR-National Physical Laboratory (NPL), NMI of India. It is intended to be used for calibration of equipment, evaluating proficiency of analysts and evaluating/comparing various test methods etc. as well as import substitution which led to saving of foreign exchange.

The following BNDs are commercially available:

Sl. No.	BND No.	Material Description	Parameters
1	5001	OPC - (Lower Range) (Fineness : 250 - 300 m^2/kg)	Blaine's fineness & Specific gravity
2	5021	OPC - (Middle Range) (Fineness : 320 - 360 m^2/kg)	Blaine's fineness & Specific gravity
3	5011	OPC - (higher Range) (Fineness : 400 - 450 m^2/kg)	Blaine's fineness & Specific gravity
4	5002	PPC (Fineness : 200 - 500 m^2/kg)	Blaine's fineness & Specific gravity
5	5003	PSC (Fineness : 200 - 500 m^2/kg)	Blaine's fineness & Specific gravity
6	5004	Fly ash (Fineness : 200 - 500 m^2/kg)	Blaine's fineness & Specific gravity
7	5006	Composite cement (Fineness : 200 - 500 m^2/kg)	Blaine's fineness & Specific gravity
8	5007	WPC (Fineness : 200 - 500 m^2/kg)	Blaine's fineness & Specific gravity
9	5008	Granulated Blast Furnace Slag	Blaine's fineness & Specific gravity
10	5009	Ordinary Portland Cement	Residue on 45 µm sieve (wet sieving)

11	5051	OPC	LOI, SiO_2, Fe_2O_3, Al_2O_3, CaO, MgO, Mn_2O_3, TiO_2, SO_3, IR, Na_2O, K_2O & Cl
12	5052	PPC	LOI, MgO, SO_3, IR, Na_2O, K_2O & Cl
13	5053	PSC	LOI, SiO_2, Fe_2O_3, Al_2O_3, CaO, MgO, Mn_2O_3, TiO_2, P_2O_5, SO_3, Na_2O, K_2O, Cl, Sulphur & IR
14	5054	Fly ash	LOI, SiO_2, Fe_2O_3, Al_2O_3, CaO, MgO, SO_3, Cl, Na_2O & K_2O
15	5055	Composite cement	LOI, SiO2, Fe2O3, Al2O3, CaO, MgO, SO3, IR, Na2O, K2O & Cl
16	5056	Limestone	LOI, SiO_2, Fe_2O_3, Al_2O_3, CaO, MgO, Mn_2O_3, TiO_2, P_2O_5, Na_2O, K_2O, SO_3 & Cl
17	5057	Raw Meal	LOI, SiO_2, Fe_2O_3, Al_2O_3, CaO, MgO, SO_3, Na_2O, K_2O, Cl, Mn_2O_3 & TiO_2
18	5058	Clinker	LOI, SiO_2, Fe_2O_3, Al_2O_3, CaO, MgO, SO_3, Na_2O, K_2O, Cl, Mn_2O_3 & TiO_2
19	5059	GGBFS	GOl, SiO_2, Al_2O_3, CaO, MgO, SO_3, IR, Na_2O, K_2O, Mn_2O_3 & Sulphide sulphur
20	5061	Pet Coke	Ash Content, Volatile Matter, Sulphur & Calorific value
21	5063	Gypsum	Combined water, SiO_2 +Acid insoluble, Fe_2O_3+Al_2O_3, CaO, MgO, SO_3 & Cl (as NaCl)
22	5064	White Portland Cement	LOI, SiO_2, Fe_2O_3, Al_2O_3, CaO, MgO, SO_3, Na_2O, K_2O & Cl
23	5091	Coal	Ash content, Volatile matter, Sulphur & Calorific value (values based on dried basis)

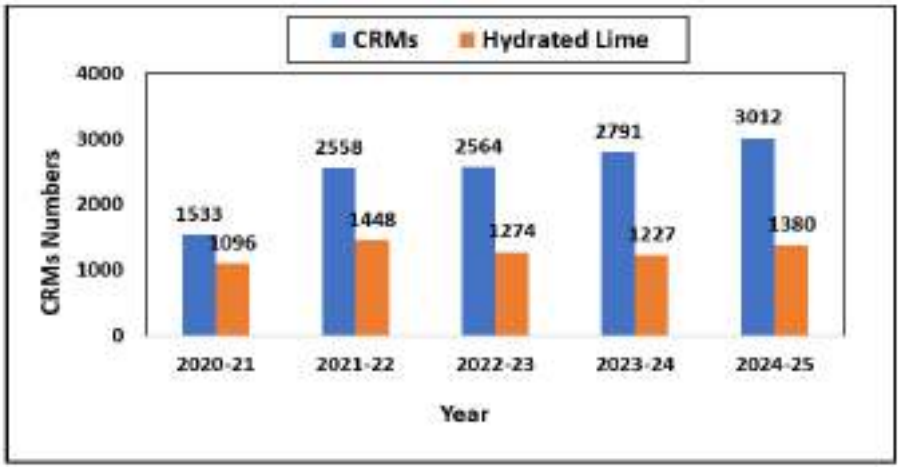
The following RMs/CRMs are also commercially available:

Sl. No.	RMs/CRMs No.	Material Description	Parameters
1	CRM 1010	Hydrated Lime (for LR test)	CaO, MgO, SiO_2 & IR
2	CRM 1040	Silica Fume	LOI, SiO_2, Na_2O, & K_2O
3	CRM 1011	Clay	LOI, SiO_2, Fe_2O_3, Al_2O_3, CaO, MgO, Na_2O, K_2O, TiO_2, P_2O_5, Mn2O3

4	CRM 1002D	Calcined Clay Pozzolana	Blaine's fineness & Specific gravity
5	CRM 1045	Bauxite	LOI, SiO_2, Fe_2O_3, Al_2O3, CaO, MgO, Na_2O, K_2O, Cl, TiO_2, Mn_2O_3, P_2O_5
6	CRM 1044	Iron Ore	SiO_2, Fe_2O_3, Al_2O_3, CaO, MgO, Na_2O & K_2O
7	CRM 1037	Fly ash	ROS: 45 µm (wet sieving)
8	CRM 1036	Ordinary Portland Cement	Residue on 90 µm (Dry Sieving)
9	RM 1041	Red Ochre	SiO_2, Fe_2O_3, Al_2O_3 & CaO
10	RM 1039	Laterite	SiO_2, Fe_2O_3, Al_2O_3, CaO, MgO, SO_3, Na_2O & K_2O

During the year, total 3,012 units of different CRMs including BNDs and 1,380 sets of standard lime were supplied to 1361 customers of cement plants, testing laboratories, public sector undertakings, R&D institutions including international clients viz Nepal, Bhutan, Bangladesh, Tanzania etc.

The sale records for the past five years are represented in graph below.



Release of BNDs in the Year 2024-25:

Gypsum – Chemical Parameters (BND 5063)

Ms Arti Bhatnagar, Additional Secretary & Financial Adviser - DPIIT released Bhartiya Nirdeshak Dravya (BND), the Indian Certified Reference Materials, of Gypsum developed by NCB at glittering programme on 18th NCB International Conference & Exhibition on 29th November 2024 at YashoBhoomi, IICC Dwarka, New Delhi.

White Portland Cement – Chemical Parameters (BND 5064)

Bhartiya Nirdeshak Dravya (BND), the Indian Certified Reference Materials, of White Portland Cement developed by NCB was released by Prof. V Kamakoti (Director – IIT Madras), Prof Venugopal Achanta (Director, CSIR NPL) and NCB team on the occasion of 79th Foundation Day of CSIR-NPL on 4th Jan 2025.

Calibration Services

The calibration laboratories of the center are equipped with the sophisticated equipment and state of the art facilities. The laboratories constantly strive to improve accuracies and uncertainties of measurement of existing calibration facilities and also expand the scope of calibration activities.

The laboratories have acquired sophisticated equipment like Dry Block Calibrator, Temp and Humidity Calibrator, Force Proving Instruments, Universal Length Machines etc. The laboratories are in advance stages of procuring equipment to provide state-of-the –art facilities in the fields of Mass Metrology, High Temperature Metrology, Force Metrology etc.

The laboratories have developed new Laboratory Infrastructure known as Advance Calibration Laboratories which is equipped with state-of-the-art equipment like Force Calibration Systems - 2 to 200 kN, Facilities for calibration of Weights from 1mg-150 kg, Volumetric Glassware and Pressure-1.5 to 1400 bar.

The advance calibration laboratories were inaugurated on 23rd December, 2024.

Force Calibration System – 2 to 20 kN

Force Calibration System – 20 to 200 kN

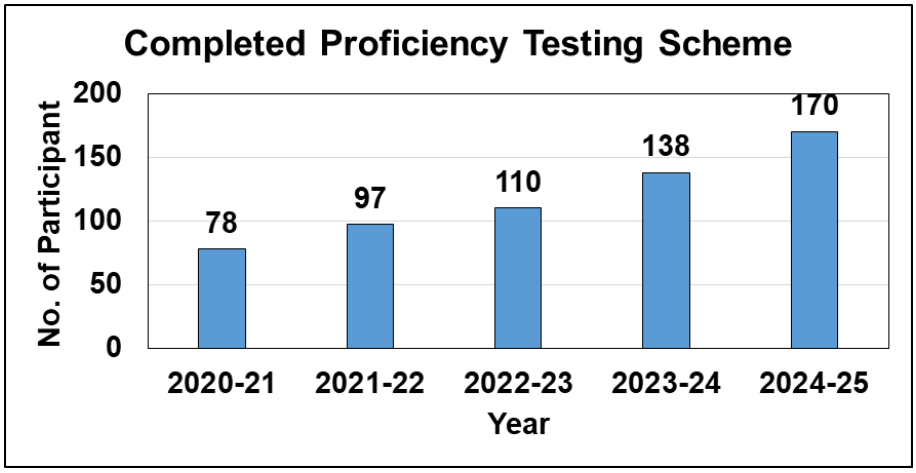
The calibration laboratories are accredited as per ISO/IEC 17025:2017 in the fields of force, pressure, temperature & humidity, dimension, mass & volume and RPM. More than 1500 equipment/instrument were calibrated at NCB's testing laboratories and at customer's site. The calibration services are being provided to various Central Govt., State Govt., PSUs, Cement & Construction Industries and have shown remarkable growth.

It is pertinent to mention that more than 95% customers rated our services as excellent in the financial year 2024-25.

Interlaboratory Services (ILS)

Interlaboratory Services (ILS) of NCB are India's 1st accredited services as per ISO/IEC 17043. Since its inception, NCB-ILS services have completed more than 125 programme in the area of Cement and Building Materials. NCB's Interlaboratory Services (ILS) are accredited as per ISO/IEC 17043:2023.

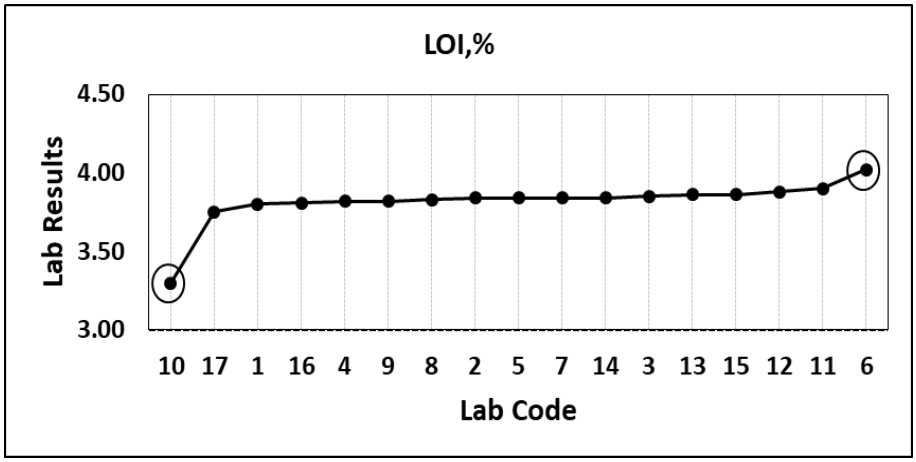
The present scope of accreditation covers: limestone, clinker, cement, fly ash, concrete admixture, water for concrete & coal/coke/pet coke in chemical field and cement, fly ash, aggregate, mortar/concrete, tile (ceramic), burnt clay building brick & steel bar in mechanical field. NCB-ILS has completed 13 PT schemes in the financial year 2024-25. In this financial year, NDT for Concrete is added to the accreditation scope as per ISO/IEC 17043:2023. The participants were mainly from reputed private laboratories, cement plants, govt. laboratories, public sector laboratories etc. No. of laboratories participated in the Proficiency testing for the past five years is depicted in the graph as below:



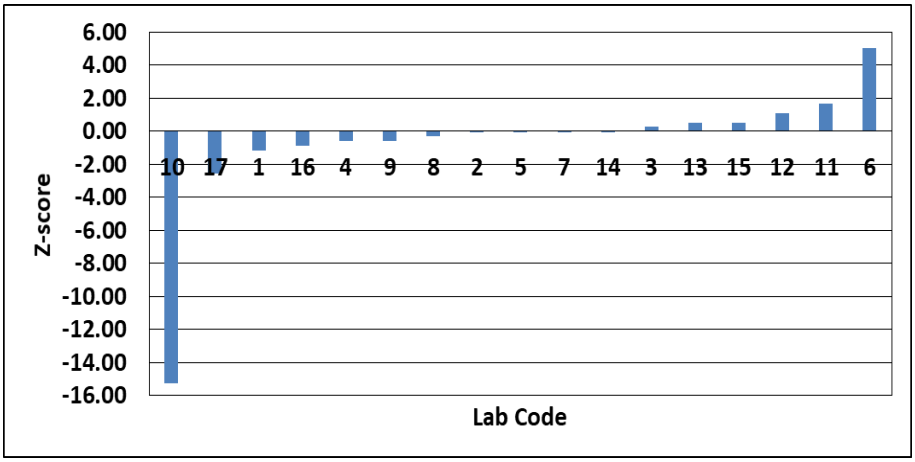
The participating laboratories were provided homogenized samples of PT items for testing in their laboratories. The test data reported by the laboratories were statistically evaluated for central tendency, spread and Z-score. The robust average and standard uncertainty for each parameter were calculated after normalizing the data as per ISO 13528:2015(E). Laboratories were evaluated on the basis of Z-Scores based on robust average and robust standard deviation.

Z-scores/Z'-scores for all the parameters in all schemes were calculated on the basis of results provided by the participant laboratories. As per the above standard, performance of the laboratories with $|Z| \leq 2.0$ is considered satisfactory. The laboratories getting $|Z| \geq 3.0$ are considered outliers and those getting $2.0 < |Z| < 3.0$ score are considered questionable performers. Outliers are encountered due to lack of statistical control and increase in variation in data.

Data received from the laboratories were studied for distribution and scatter. Out of 13 PT schemes, example for OPC-Chemical is illustrated here as under. The scatter of results in OPC-Chemical scheme show presence of bias. In the scatter plot of results, code number of the outlier laboratory (Lab code: 10 & 6) is mentioned along with the data point. Outlier's performers are put in circle. The scatter of results for 'Loss on Ignition' (LOI) test of OPC-Chemical is shown in the following figures:



Scatter Plot of Test Results – 'LOI' (%) of OPC-Chemical (ILS/PT/122)



Bar Chart of Laboratory Performance for Sample – 'LOI' (%) of OPC-Chemical (ILS/PT/122)

Total Quality Management (TQM)

Total Quality Management programme under CQC provides various consultancy services on Quality Management to cement plants, Academic institutions, Laboratories and R&D organizations etc. The scope of the services under TQM are as under:

- To provide consultancy to laboratories in establishing, Implementing QMS and preparing them to get accreditation as per ISO/IEC 17025:2017
- Training on ISO/IEC 17025: 2017 structure covering the requirements of this international standard.
- To carry out the Gap Analysis of laboratory infrastructure, manpower, equipment and other resources as per ISO/IEC 17025:2017.
- Management, Technical and support processes required to implement ISO/IEC 17025:2017.

During the FY 2024-25, 1 consultancy project on "NABL accreditation as per ISO/IEC 17025:2017 for FQA Laboratory of M/s NTPC Limited, Koldam Hydro Power Station, Bilaspur" is in process.

Centre for Industrial Information Services-(CIS)

The Centre pursued its activities through six programmes viz. Library, Integrated IT Solutions, Publications & Image Building, Seminars and Conferences, International and National Linkages, and Incubation Centre. CIS collects and disseminates information to cement, building materials and construction industries. Besides other facilities, the Centre includes a modern library and a computer centre.

Library and Information Services

Library added 17 documents to its collection and entries of 50 references to the Bibliographic database taking the total numbers to 47142 documents and 44,800 references respectively. The Bibliographic database is used by scientists for interactive searches.

NCB Ballabgarh Library

Publications & Image Building

Information on technologies and services of NCB is disseminated through NCB Publications regularly. Efforts to widely popularize and promote NCB activities, technology and consultancy services amongst the cement and related building materials industries were continued. The following publications were brought out during the year are as follows:

- NCB Annual Report 2023-24 in English and Hindi versions separately
- NCB Darpan

National and International Linkages / Collaboration Programmes

NCB has been actively interacting and liaising with a number of international bodies and exchanging knowledge and experience particularly in the area of cement and building materials industries.

MoUs signed by NCB during the year 2024-25 are:

- StartUp India
- Global Cement and Concrete Association (GCCA) India
- AIC Institute of Plasma Research - Plasmatech
- National Institute of Solar Energy, Gurugram, Haryana
- Manav Rachna International Institute of Research & Studies (MRIIRS)

NCB Incubation Centre (NCB-IC)

The Incubation Centre (NCB-IC) at NCB Ballabgarh for StartUps working in the field of cement, construction and building materials was inaugurated by Shri Sanjiv, Joint Secretary, DPIIT, Ministry of Commerce and Industry, Government of India in

presence of Shri Rajendra Chamaria, Vice-Chairman-NCB and VC & MD-Star Cement Ltd.; Shri Mahendra Singhi, Member of Board of Directors & Advisor, Dalmia Cement (B) Ltd. and Dr L P Singh, Director General-NCB on 20th May 2024 at NCB Ballabgarh. StartUps working with NCB, mentors, representatives from cement industry and Scientist & Engineers of NCB were present on the occasion.

During the year 2024-25, nine StartUps have been registered under NCB - Incubation Centre (NCB-IC).

StartUps registered under NCB-IC
i. Biomimicry Technologies Pvt. Ltd.
ii. Concreed Solutions Pvt. Ltd.,
iii. LivNSense GreenOps Pvt. Ltd.
iv. Onelement Energy Pvt. Ltd.
v. AltSF Process
vi. Zero Carbon One
vii. TraceXero
viii. Chainfly
ix. WIMA

Technical Insight

NCB has been actively interacting and disseminating information with a number of stakeholders and exchanging knowledge and experience particularly in the area of cement and building materials industries.

On National Science Day, NCB launched Distinguished Lecture Series. The Inaugural Lecture was delivered by Prof. Narayanan Neithalath on "**Novel Approaches in Cement Producon - Coupling Materials Efficiency, Manufacturing**

Approaches and Decarbonizaon". Prof. Neithalath presented the decarbonisation pathways for cement industry.

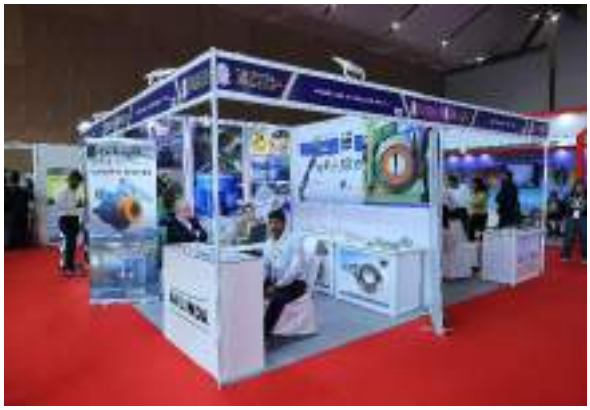
18th NCB International Conference and Exhibition on Cement, Concrete and Building Materials

The 18th NCB International Conference & Exhibition on Cement, Concrete, and Building Materials, a Maha Kumbh of Cement and Concrete Industry, was successfully organized from 27 - 29 November 2024 at Yashobhoomi Convention Centre, IICC Dwarka, New Delhi, India.

The conference was inaugurated by Shri Amardeep Singh Bhatia, Secretary, DPIIT, Ministry of Commerce and Industry, Government of India in presence of Shri Sanjiv, Joint Secretary, DPIIT; Shri Neeraj Akhoury, Chairman-NCB, President-CMA & MD-Shree Cement Ltd.; Shri Mahendra Singhi, Member of Board of Directors and Strategic Advisor, Dalmia Cement (Bharat) Ltd. on 27th November 2024 at Yashobhoomi Convention Centre, Dwarka, New Delhi. The concurrently held Technical Exhibition with the conference was also inaugurated. The conference saw participation of 1100+ delegates, 600+ visitors, 140+ students, 16 session keynote addresses, 155 oral presentations and 70 poster presentations of technical papers, 133 Exhibitors including 09 StartUps and 204 Exhibition Stalls.





Sponsors of 18th NCB International Conference

Sl. No.	Name of Sponsors	Category
1.	Shree Cement Ltd.	Chief Patrons
2.	UltraTech Cement Ltd.	
3.	Dalmia Cement (Bharat) Ltd	Patrons Sponsor
4.	Adani Group (Cement)	
5.	J K Cement Ltd.	Gold Sponsor
6.	Star Cement Ltd.	
7.	Saurashtra Cement Ltd.	Kit Bag Sponsor
8.	My Home Industries Pvt Ltd.	Bronze Sponsors
9.	Prism Johnson Ltd.	
10.	JSW Cement Ltd.	
11.	TRL Krosaki Refractories Ltd.	
12.	J K Lakshmi Cement Ltd.	
13.	Fornnax Technology Pvt. Ltd.	High Tea Sponsor

Supporting Organizations / Departments

The conference was supported by:

1. DPIIT, Ministry of Commerce & Industry
2. Council for Scientific and Industrial Research (CSIR)
3. Bureau of Energy Efficiency (BEE)
4. Bureau of Indian Standards (BIS)
5. Global Cement & Concrete Association (GCCA) India
6. Cement Manufacturers' Association (CMA)
7. South India Cement Manufacturers' Association (SICMA)

Media Partners

1. International Cement Review
2. Indian Cement Review
3. Indian Concrete Journal
4. CE&CR
5. Construction World
6. Cement Russia

During the Conference, five NCB publications were released viz:

1. Conference Souvenir
2. Conference Proceedings
3. 4th edition of Compendium
4. Alternative Fuels & Raw Materials for Indian Cement Industry
5. 7th edition of NCB Guide norms for cement plant operation

In his inaugural address, Shri Amardeep Singh Bhatia Secretary-DPIIT complimented the Indian cement industry for being one of the best in the world in terms of energy efficiency and role played by cement industry in circular economy framework in our country.

Shri Sanjiv, Joint Secretary, DPIIT was the guest of honour on the occasion, requested cement industry to support StartUps working in the field of cement, concrete and building materials sector.

Shri Neeraj Akhoury, Chairman-NCB, President-CMA & MD-Shree Cement Ltd. and Shri Mahendra Singhi, Member of Board of Director & Strategic Advisor, Dalmia Cement (B) Ltd. also addressed the gathering on achievements of Indian cement industry and challenges faced to achieve the target of Net Zero by 2070.

Speaking on the occasion, Dr L P Singh, DG-NCB highlighted the role of research and development in tackling the issues of Indian Cement Industry such as decarbonization, circular economy and sustainability.

There were plenary sessions on each day of the conference covering 05 presentations from Industry Stalwarts viz.

1. "Carbon Conscious Concrete and Nanotechnology" by Prof S P Shah, Presidential Distinguished Professor, University of Texas at Arlington, USA, Walter P. Murphy, Professor (Emeritus) Northwestern University, USA
2. "'Automated' to 'Autonomous' Process for Cement Production: How Distant is the Destination?" by Dr A K Chatterjee, Fellow, Indian National Academy of Engineering & Chairman-Conmat Technologies
3. "The role of cement hydration in decarbonising cement-based materials" Prof Karen Scrivener, Professor & Head, Laboratory of Construction Materials, Department of Materials, Swiss Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland
4. "Binding the Future – From Calcined Clays to Extrusion" by Prof Dr-Ing. Thomas Matschei, Chair of Building Materials, Institute of Building Materials Research, RWTH Aachen University, Germany
5. "Innovation at Holcim, an industrial point of view about progressively tackling the challenges for cementitious materials players: reaching Zero CO emissions and Zero natural resources" by Mr Christophe Levy, Scientific Director, Holcim Innovation Center, Lyon, France




Two panel discussions were held on contemporary topics like "Cementing the Net Zero by 2070: Leadership Perspectives from Indian Cement Industry" and "Transforming Indian Standards to Performance Based Design of Concrete" involving leaders of Indian Cement Industry and Industry, Research & Academic Experts were the highlight of the conference.

During the conference, NCB Life Time Achievement Award in the field of Cement and Concrete Sector was conferred on Padma Shri Dr H C Visvesvaraya, Ex-CDG, NCB.

During the conference, three Short Films made by the National Council for Cement & Building Materials were also released viz:

1. 200 Glorious Years of Cement and Concrete Construction Industry.
2. NCB Corporate Video
3. NCB International Conferences - A Maha Kumbh of Cement and Concrete Industry.

Ms Arti Bhatnagar, ASFA-DPIIT presented National Awards to the best participating cement plants in the field of energy excellence, improvement in energy performance, environment excellence, total quality excellence and achieving circular economy in integrated cement plants and energy & environment excellence in cement grinding units. These awards emanated from suggestion at the 1st NCB International Seminar in 1987, and at the instance of Ministry of Industry, the scheme of National Award for Energy Efficiency was started from the year 1986-87.

List of Recipients of National Awards for Indian Cement Industry

S.NO.	AWARDS	Plant Name
I.	**Awards for Energy Excellence in Integrated Cement Plants**	
1.	Best Award for Energy Excellence in Integrated Cement Plants	Sree Jayajothi Cements Pvt Ltd. (100% Subsidiary of My Home Group Industries), Nandyal, A.P.
2.	Second Best Award for Energy Excellence in Integrated Cement Plants	RCCPL Pvt Ltd., Maihar, Satna, M.P.
II.	**Awards for Improvement in Energy Performance in Integrated Cement Plants**	
1.	Best Award for Improvement in Energy Performance in Integrated Cement Plants	Dalmia Cement (Bharat) Ltd., Belgaum Cement Plant, Karnataka
2.	Second Best Award for Improvement in Energy Performance in Integrated Cement Plants	UltraTech Cement Ltd., Nathdwara Cement Works, Sirohi, Rajasthan
III.	**Awards for Environment Excellence in Integrated Cement Plants**	
1.	Best Award for Environment Excellence in Integrated Cement Plants	UltraTech Cement Ltd., Andhra Pradesh Cement Works
2.	Second Best Award for Environment Excellence in Integrated Cement Plants	Dalmia Cement (Bharat) Ltd., Belgaum Cement Plant
IV.	**Awards for Total Quality Excellence in Integrated Cement Plants**	
1.	Best Award for Total Quality Excellence in Integrated Cement Plants	M/s Shree Cement Ltd., Ras, Bangur City, Ras-306107, Rajasthan
2.	Second Best Award for Total Quality Excellence in Integrated Cement Plants	M/s UltraTech Cement Ltd., Aditya Cement Works
V.	**Awards for Achieving Circular Economy in Integrated Cement Plants**	
1.	Best Award for Achieving Circular Economy in Integrated Cement Plants	UltraTech Cement Ltd., Reddipalayam Cement Works
2.	Second Best Award for Achieving Circular Economy in Integrated Cement Plants	UltraTech Cement Ltd., Rawan Cement Works

VI.	**Awards for Energy Excellence in Cement Grinding Units**	
1.	Best Award for Energy Excellence in Cement Grinding Units	UltraTech Cement Ltd., Arakkonam Cement Works
2.	Second Best Award for Energy Excellence in Cement Grinding Units	J K Cement Works, Jharli
VII.	**Awards for Environment Excellence in Cement Grinding Units**	
1.	Best Award for Environment Excellence in Cement Grinding Units	UltraTech Cement Ltd. – Ginigera Cement Works
2.	Second Best Award for Environment Excellence in Cement Grinding Units	ACC Ltd. – Madukkarai Cement Works




Ms Bhatnagar released the Bharatiya Nirdeshak Dravya (BND), an Indian Certified Reference Material of Gypsum Standard produced by NCB in collaboration with NPL, NMI of India. The BND plays a pivotal role in fulfilling the ambitions of "Make in India" and "Atma Nirbhar Bharat" and will substitute the import of international CRM and help in saving foreign Exchange. Ms Bhatnagar also visited the technical exhibition concurrently held with the conference and interacted with StartUps exhibiting in the conference. Shri Mahendra Singhi, Member of Board of Governors &

Strategic Advisor, Dalmia Cement (Bharat) Ltd., Guest of Honour on the occasion presented certificates to the papers of Special Merit presented during the conference.

Visitors

Important Visitors (from 1st April 2024 to 31st March 2025)

Date	Name	Organization
12.07.2024	Dr. D K Aswal Director HS&EG	BARC, Mumbai
03.09.2024	Sh Suyash Ratna Tripathi Startup India	DPIIT, Ministry of Commerce & Industry.
30.10.2024	Sh Rajesh Rawat Under Secretary	DPIIT, Ministry of Commerce & Industry.
	Sh Sumit Dalal Section Officer	
23.12.2024	Sh Sanjiv Joint Director	DPIIT, Ministry of Commerce & Industry.
	Sh Madhav K Singhania Joint MD & CEO	J K Cement Ltd

Participation in Events

The following NCB officials participated in Seminars & Conferences shown against their names during the period:

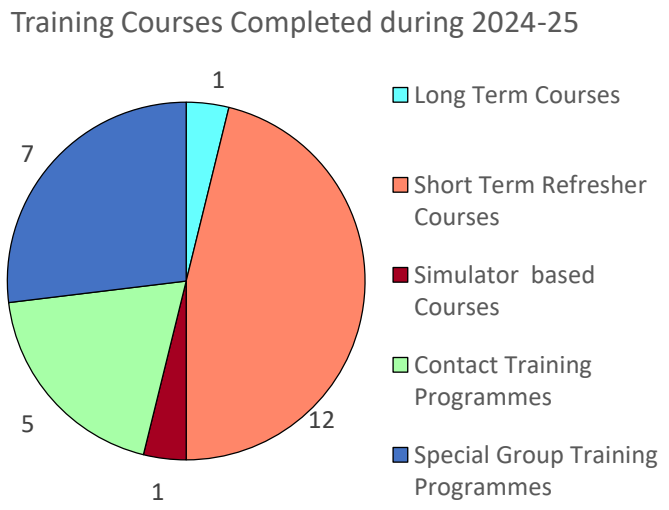
Sl.No.	Participant(s)	Event
1.	Sh Manoj Kumar	"Two-day Online Workshop on e-office (WEO-16) from 06th to 07th May 2024 organized by Department of Personnel Training.
2.	Sh P N Ojha Sh Arup Ghatak Sh Dheerendra Singh	"Training Programme on Limestone Calcined Clay Cement on 09th to 10th May 2024 organized by Department of Civil Engineering, at IIT Delhi, New Delhi.
3.	Dr. Prateek Sharma	"Training Programme on Public Procurement (BASIC) from 13-18 May 2024 organized by Arun Jaitley National Institute of Financial Management (AJNIFM).
4.	Sh P N Ojha Sh Amit Trivedi Sh Brijesh Singh Sh Puneet Kaura	10th International Conference on Concrete under Severe Condition (CONSEC) – Environment & Loading on 25-27 September 2024 organized by Centre of Excellence on Technologies for Low-Carbon and Lean Construction (TLC2) at IITM Research Park, IIT Madras, Chennai.

Centre for Continuing Education Services-(CCE)

Centre for Continuing Education Services (CCE), has been organizing various need-based and industry-oriented training programmes at all levels, for the participants from cement, concrete and construction industries since its inception in 1972. Participants comprising of industry professionals and fresh graduates/post-graduates in science and different disciplines of engineering have benefited. A number of Govt./Semi-govt./Private organizations both from India and abroad have availed the training services of NCB for their engineers and professionals.

During the year 2024-25, 26 training programmes (offline/online) were successfully organized with a total participation of 328 professionals from cement, concrete and construction industries.

The highlights of the training programmes conducted are as under:



Type of Course	No.
Long Term Courses: PG Diploma in Cement Technology	1
Short Term Refresher Courses	12
Simulator Based Training Programmes	1
Contact Training Programmes	5
Special Group Training Programmes	7

Long Term Courses

Post-Graduate Diploma in Cement Technology

In its efforts to develop technological talent for the cement industry, NCB has been regularly conducting Post-Graduate Diploma in Cement Technology since 1983. The course is duly approved by All India Council for Technical Education (AICTE), Ministry of Human Resource Development, Govt. of India.

In the academic year 2023-24, 14 self-sponsored candidates have successfully completed the course in July 2024. Most of the students were placed in Indian cement industry successfully. In the academic session 2024-25, 12 students have taken admissions.

Short Term Refresher Courses

During this year, 12 (nos.) of Short Term Refresher Training Courses were organized wherein 174 professionals from cement and construction industries participated.

In Cement Technology related area, special emphasis was given to courses such as Sampling, Testing of Cement as per BIS Standards; Consumer Complaint & Handling Techniques in Cement Marketing; Enhancement of Alternate Fuels and Raw Materials in Cement Industry; Alternate Fuels and Raw Materials in Portland Cement Manufacture; Best Safety Practices in Cement Industry.

In Concrete and Construction related areas, the training programmes on specific topics were conducted such as; Concrete Mix Proportions and Acceptance Criteria; Non-destructive Testing and Evaluation of Concrete Structures; Cracks and Leakages in Concrete Structures: Causes, Prevention and Repair; Desirable properties of Fresh Concrete and Endurance of Hardened Concrete; Pre-cast Concrete Structures, Materials and Technologies were organized.

Simulator Based Courses

With the aim of providing comprehensive training on various aspects of cement plant operation, training course on Advanced Simulator trainer was organized at NCB's Ballabgarh unit for 05 professionals. The participants were trained on Operation, Control and Optimization of Modern Grinding System based on Roller Press and Ball Mills.

Lecture during Training Programme at NCB-B

Lecture during P G Diploma in Cement Technology

Lectures during Training Programme at NCB-H

Lab Demo Sessions during Training Programmes at NCB-B

Contact Training Programmes

On the request of industry, **five** tailor-made practice-oriented contact training programmes for 07 professionals from cement and construction industries were organized at NCB-B & NCB-H to suit their specific requirements covering under the following areas:

- EDTA Methods of Analysis for Cement and Raw Materials
- Blaine Air Permeability and Estimation of Total Carbonates in Raw Materials
- Chemical Analysis of Cement and Proximate Analysis of Fuel
- Physical Testing of Cement
- Testing of cement for chemical and physical properties

Special Group Training Courses

CCE is also organizing customized training programme for a group of professionals on cement & concrete. **Seven** nos. of special group training courses on specific topic for the group of engineers/professionals were organized in online/offline mode at Sponsor's site & NCB-Ballabgarh, details are given below:

Sl No.	Organization	Topics of the Courses Organized
1	M/s Hindustan Power Corporation Ltd. (HPCL)	➢ Quality Control & Quality Assurance in Concrete Structure
2	M/s J K Cement Limited	➢ Raw Mix Design for Clinker Manufacturing
3	M/s National Thermal Power Corporation Ltd. (NTPC) (Batch I)	➢ Quality Control and Quality Assurance in Concrete Structure
4	M/s National Thermal Power Corporation Ltd. (NTPC) (Batch II)	➢ Quality Control and Quality Assurance in Concrete Structure
5	M/s Bharat Heavy Electrical Limited (BHEL)	➢ Quality Control and Quality Assurance, Mix Design in Concrete Construction
6	M/s Orient Cement Limited (Online mode)	➢ Laboratory QMS and Internal Audit as per ISO/IEC 17025:2017
7	M/s Gujarat Engineering Research (GERI)	➢ Concrete Mix Design and Quality Control

Participants of NTPC (Batch I) & (Batch II)during Special Group Training Programme(s) at NCB-Ballabgarh

Participants of Bharat Heavy Electrical Limited during Special Group Training Programme at NCB-Ballabgarh

Participants during Training Programme on Cracks & Leakages in Concrete Structures: Causes, Prevention and Repair

Participants of J K Cement Limited during Special Group Training Programme at NCB-Ballabgarh

Visit of Participants from GERI to the Badrabad Dam, Roorkee

List of NCB officials who have undergone training for 2024-25

Sl No	Name of the Official	Title of course	Name and address of Training Organisation	Duration and Period
1 2 3	Dr Asesh Das Dr Jitendra Singh Dr Umashankar Soni	Sampling and Testing of Cement as per BIS Standards	NCB-B	3 day 29 April - 01 May 2024

1	Sh Abhishek Agnihotri	Characterization and Assessment of Homogeneity and Stability of Reference Material as per ISO Guide 35	National Accreditation Board for Testing and Calibration Laboratories (NABL) Delhi	2 day 16-17 May 2024
1 2 3 4 5	Dr Asesh Das Sh Chandan Kumar Dr Jitendra Singh Ms Moon Chourasia Dr Umashankar Soni	Alternate Fuels and Raw Materials in Portland Cement Manufacture	NCB-B	2 day 05-06 Sep 2024
1 2 3 4 5 6	Sh Anwar Salim Sh Dheerendra Singh Sh Kunal Gupta Sh Mohit Agarwal Sh Rohit Kumar Sh Shailendra Kumar Singh	Cracks and Leakages in Concrete Structures: Causes, Prevention and Repair	NCB-B	2 day 12-13 Sep. 2024
1 2 3 4	Sh Ajay Rana Sh Gautam Sh Mahesh Mishra Sh Vipin Rana	Non-destructive Testing and Evaluation of Concrete Structures	NCB-B	3 day 18-20 Dec. 2024

NCB Hyderabad

NCB Hyderabad Unit

NCB Hyderabad is the regional centre established in 1982 in a sprawling campus having world class testing, R&D and training facilities. The activities of NCB Hyderabad are illustrated through Concrete Technology, Structural Assessment and Rehabilitation the respective centers which provide various testing, R&D facilities, training, energy auditing, Third Party quality assurance and other consultancy services to the cement and construction industries. The unit has adopted quality management systems and certified with ISO 9001:2015.

Centre for Cement Research and Independent Testing (CRT)

R&D Actities

Investigations on utilization of fly ash, generated by co-firing of biomass, in cement manufacturing (WAU-23):

To tackle stubble burning issues and to reduce CO_2 emissions from coal based thermal power plants, Ministry of Power is promoting the use of Biomass. It has been mandated that all thermal power plants to use 5% blend of biomass pellets made, primarily, of agro-residue along with coal. Estimated availability of biomass in India is at about 750 million metric tons per year. Biomass is generally characterized by high moisture contents, lower heating values, and a variety of minor constituents, such as chlorine, alkalis, sulfur, phosphorus etc. Biomass when co-fired along with conventional fuels, the characteristics of biomass may affect the utilization potential of resultant ash by changing its overall composition. Therefore, while co-firing biomass in thermal power plants, there should be consideration of the effects of biomass on the properties of fly ash.

Biomass materials that can be used for power generation include bagasse, rice husk, straw, cotton stalk, coconut shells, soya husk, corncob, coffee waste, jute wastes, ground nut shells, saw dust etc. In the European context, co-combustion of biomass is extensively studied at laboratory, pilot plant and full plant scales. Pre-processing units for biomass help in preparation of uniform quality of feed. In case of biomass containing high heating values and low ash contents, its co firing did not show any significant effect on the resultant fly ash and it is effectively utilized in the civil engineering sector. However, biomass containing higher quantities of alkali, P, Cl and high ash content may cause corrosion problems in the system and the quality of the resultant fly ash will be affected significantly. Presence of alkali, Cl etc. also limits its usage in cement and concrete due to their potential alkali silica reactions and chloride induced corrosion in reinforced concrete structures. Ashes from biofuels may also contain heavy and toxic elements, depending on its sources. Therefore, NCB has taken up the studies on effect of co-firing of biomass on fly ash properties. The outcome of the project will provide comprehensive database on physicochemical properties and quality of fly ash generated from biomass co-firing.

Independent Testing Laboratory

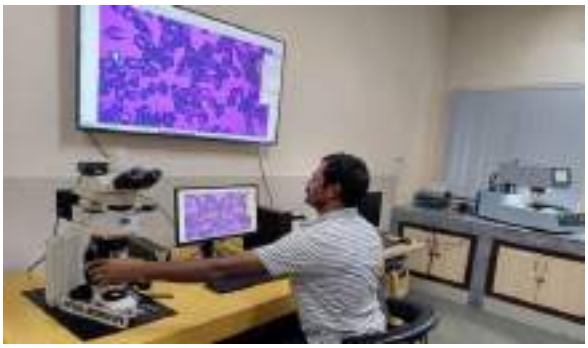
Centre for Cement Research and Independent Testing (CRT), Hyderabad unit executes its activities in the areas of Research and development studies, Industry sponsored projects and testing services. Laboratories are NABL accredited (TC-7692), BIS recognised (OSL-6114835), ISO certified, and equipped with state-of-art facilities.

Main areas of activity under CRT are:

- Independent testing laboratories has the facilities for evaluation of chemical, mechanical, mineralogical and microstructure analysis of various raw materials, in-process materials in cement production, fuels, clinker, pozzolanic materials, industrial slags, industrial waste and by-products, hydraulic cements, aggregates, water used in construction, bricks, concrete, admixtures etc. About 1689 samples have been analyzed during 2024-25.
- Development of plant specific standards for calibration of XRF
- Optimization of raw mix to improve clinker productivity
- Utilization of Industrial by-products in cement production
- Establishing Limestone Consumption Factor

Development of Plant Specific Standards for Calibration of XRF:

XRF plays crucial role in quality control in cement plants. Accuracy of the results of XRF for the most part depends on the standards used for the calibration of equipment. NCB developed a programme for preparation of plant specific secondary working standards for calibration of XRF, so as to maximize the accuracy of the results. NCB successfully completed several projects for the various materials being used in cement industry, viz., limestone, additives, raw meal, kiln feed, clinker, cement etc. Collected samples from the plants are analyzed in NCB laboratories using different analytical techniques for chemical composition. Assigned true values after the analysis of generated data from different NCB laboratories are used to calibrate the XRF of plant laboratories. Critical samples like check samples, drift correction sample etc. along with developed standard samples are provided to the plants for regular monitoring of the performance of XRF.



Centre for Quality Management, Standards & Calibration Services (CQC)

Calibration of more than 212 Proving Rings (50kN, 100kN, 250kN, 500kN, 1000kN, 2000kN) from cement and allied industries, testing laboratories & educational institutions was completed, which helps in maintaining the accuracy of compressive strength measurements. New calibration laboratory was set up with the scope established in the areas of thermal, dimension, mass, volume and force (Proving rings). The laboratory is in the process of obtaining NABL accreditation.

Centre for Mining, Environment, Plant Engineering and Operations (CME)

Mandatory Energy Audits

Mandatory Energy Audit was conducted for both the plants of M/s Saurashtra Cement Ltd. Team from NCB Hyderabad was associated with NCB-B team for both plants of Ranavav and Sidheegram. One of the plants the team was led by Hyderabad team. Various Process Measurement in Kiln, Preheater, Precalciner, Raw mill, coal mill, cement mill and packing plants were carried out. The audit comprises of Thermal & Electrical energy consumption and also compressor air audit carried out to evaluate the energy consumption and to identify the potential areas for energy conservation. The electrical energy comprises of major drives, lighting, pumps etc. Report prepared including above aspects and submitted to the plants.

Similarly, the Mandatory Energy Audits were carried out for the plants of Ultratech Cements Ltd in Southern India viz., Vasvadatta Cement and Rajashree Cement Works wherein Kiln, Preheater, Precalciner, Raw mill, coal mill, cement mill and packing plants were studied for its energy consumption. The audit comprises Thermal & Electrical energy consumption and also compressor air audit carried out to evaluate the energy consumption and to identify the potential areas for energy conservation. The electrical energy comprises of major drives, lighting, pumps etc. Report prepared including above aspects and submitted to the plants.

NCB-H team also associated with Roorkee grinding unit for assessing the process aspects of the MEA study. Mill circuit and packing section was studied for assessing

the major energy consuming areas and appropriate measures for reduction was suggested.

Heat Balance and Energy Consumption Optimization Study at Sedam Unit of M/s Kesoram Industries Ltd

Heat Balance was done the four lines of the M/s Kesoram Industries Ltd at their Sedam unit in Karnataka. Various process measurements across Kiln, Preheater & Cooler were carried out at four Lines of Sedam Unit. Total thermal energy consumption from the fuel and heat loss was evaluated for Four lines. Various areas were identified where there is scope for improvement in terms of energy efficiency and the recommendations were given to take appropriate measures for optimizing energy consumption in the pyrosection.

Heat Balance Study for Cement Corporation of India, Tandur, Telangana

Heat Balance was done for M/s Cement Corporation of India at their Tandur unit in Telangana. Various process measurements across Kiln, Preheater & Cooler were carried out. Total thermal energy consumption from the fuel and heat loss was evaluated. Various areas were identified where there is scope for improvement in terms of energy efficiency and the recommendations were given to take appropriate measures for optimizing the energy consumption in the pyrosection.

Performance Evaluation of Air Pollution Control Equipment at Calcom Cement India Ltd., Umrangsu, Assam

NCB-H team associated with NCB-Ballabgarh team for Performance Evaluation of Air Pollution Control Equipment were studied in the plant attached to the various sections of the plant viz kiln, cooler, coal mill and cement mills. Process parameters pertaining to the APCE were measured across equipment. The dust concentration at inlet and outlet were measured to estimate their performance efficiency. The report submitted to the plant with recommendations improve the performance of ACPE.

Measurement of Dust Concentration at various points of Two lines of M/s APCW, UTCL, Bhogasamudram, Tadipatri, Andhra Pradesh

Monitoring of Dust load at Various Ducts in Pyro system, For M/S Andhra Pradesh Cement Works of Ultratech Cements Ltd., Tadipatri, Andhra Pradesh. The return dust concentration in the preheater down comer and dust load input to the coal mill through hot gas from the preheater outlet were measured at Line-1& 2 to determine grain load increase due to the dust entering the coal mill through hot gas and preheater cyclone dust separation efficiency.

Centre for Construction, Development and Research (CDR)

Centre for Construction Development and Research (CDR) contributes to application of scientific and technical knowledge in developing durable and sustainable civil infrastructure in the southern region of India. The Centre provides services to the cement, concrete, Building materials and construction industry through the structured programmes namely Concrete Technology (CON), Structural Assessment and Rehabilitation (SAR) and Construction Technology and Management (TPQA).

Structural Assessment and Rehabilitation (SAR)

The distress evaluation, condition assessment, repair and rehabilitation of existing structures such as buildings and industrial structures are becoming increasingly important to make them functional and conforming to the safety and serviceability requirements as these structures are aging, affected by environment conditions, fire damaged structures and heritage structures. RCC Structures were investigated by using visual observations, non-destructive evaluation technique (NDE), partially destructive tests and other field tests followed by laboratory tests on extracted core samples and chemical analysis of hardened concrete as per BIS and international standards. The investigation was generally followed by recommendation for repair and rehabilitation with state of art repair materials and implementation techniques for distressed RC structures covering specifications, cost estimates and bill of quantities and quality inspection during the repair of RCC structures is also conducted. Structures have been investigated TPQA services given for various clients viz., NTPC plants, NRSC, NSPCL plants in Chhattisgarh & West Bengal, Random Quality Inspection of SMPK Kolkata Port Trust, SPMCIL, Mint Compound, Hyderabad, STPP Singareni etc.,

Construction Technology and Management (TPQA)

Third Party Quality Assurance/Audit (TPQA) services have been provided to enhance the program's effectiveness and the opportunities for innovation in the construction industry for a wide range of construction projects such as institutional buildings, residential buildings, skill development centers, hostel blocks, Trade Centres at Telangana, Andhra Pradesh, Tamil Nadu Karnataka and Maharashtra. With strong organizational and leadership capabilities in management of construction projects, the centre is associated with various Central/ State/ Autonomous Organizations in delivering durable buildings and structures to meet specified quality standards by ensuring quality workmanship, good construction practices, use of quality materials etc. and inspections done in accordance with the relevant standards.

Third Party Quality Assurance/Audit (TPQA) services have been provided for various clients Indian Institute of Foreign Trade (IIFT) at Kakinada, Tamil Nadu Trade Promotion Organization (TNTPO), Indian Institute of Science (IISc) Bangalore, Income Tax Department Bangalore, National Institute of Bank Management (NIBM) Pune, Customs & Central Excise Department (CBIC) and Central Institute of Petrochemicals Engineering & Technology (CIPET), Chennai Projects etc.,

Concrete Technology (CON)

Testing & evaluation of concrete making materials and conducting various grades of concrete mix proportions, using different types of cements like OPC, PPC, PSC and different kinds of aggregates to enhance durability including analysis and Interpretation of Test results for Civil works for various central/state/PSUs/Private limited organizations was taken up.

Industry Interaction/Site visit photos

Centre for Continuing Education (CCE)

Centre for Continuing Education (CCE) centre organized various training courses to meet the needs of professionals from cement, concrete & construction industry. The centre has well established training complex with excellent infrastructure of class rooms of capacities up to 100 seating capacity with video conferencing facilities. A hostel block (25 Rooms) attached to the training complex is available for providing residential facility to participants. NCB has imparted training to various cement and construction companies across various levels of human resources to enhance the

momentum of "National Skill Development Program" CCE Hyderabad organized short term courses for Cement industry & Construction industry on physical mode at NCB Hyderabad unit.

CCE Hyderabad organised two short term refresher courses for Cement industry and five short term refresher courses for Construction industry in physical mode. Hands on training was imparted through Contact Training Programme on Testing of cement in chemical and physics properties. Around 12 participants benefited through NCB Training from Cement Industry representing Chettinad Cement Corp. Pvt. Ltd, The Ramco Cements Ltd, The KCP Limited, Ultratech Cement Ltd, Deccan Cements Ltd, The India Cements ltd.

Around 113 participants benefited through NCB Training from Civil & Construction Industry representing Reserve Bank of India, Hindustan Construction company ltd, Chhattisgarh State Power Generation Co. Ltd, Visakhapatnam Port Authority, CSIR-NGRI, SCCL, GETRI, CWE (AF) North, HPCL-Mittal Energy Ltd, Heavy Water board, NPTC-Sail Power Company Limited, Nuclear Power Corporation of India Limited, LIC of India, Oil India Limited, Southern Railway, Irrigation Management Training Institute, Tamilnadu (WRD) etc. Hands on training was imparted through two Contact Training Programmes on Chemical Analysis of Cement and Proximate Analysis of Fuel & Blaine Air Permeability and Estimation of Total Carbonates in Raw Materials for M/s Penden Cement Authority Ltd, testing of cement in chemical and physics properties was conducted. Six members Participated in these training programmes.

Glimpses of Training Programmes:

Training Methodology & Environment

The training techniques include lectures, group discussions, case studies, field visits, audio-visual, presentations, educational films, experience sharing, laboratory practical sessions, demonstration and hands-on training. Two-way interaction between the faculty and participants is encouraged.




Training Infrastructure:

Lab Demonstration / Hands-On Practices

NCB's laboratories are equipped with most modern and state-of-the-art equipment for providing complete range of evaluation and testing facilities both for cement and concrete industries. The participants are familiarized with the latest equipments and testing techniques during demonstration/ hands-on practice sessions.




DG Interaction with NCB-H staff on 03 July 2024


Visit of Vardhaman College of Engineering students to NCB-H


18th Conference Meeting

Swachhata Hi Seva 2024



Vigilance Awareness Compaign 2024


Blood Donation Camp was organized at NCB-Hyderabad on 17-09-2024; Around 19 members have donated Blood


Plantation under "Ek ped maa ke naam"


National Events: NCB-H celebrated Independence Day and hoisted the National Flag on Aug 2024


National Events: NCB-H celebrated Republic Day and hoisted the National Flag on Jan 2025




Shramadan Swachchata Hi Seva at NCB premises

Swachchatha Awareness to the Students of Govt. Junior College Madhura Nagar

Swachchata Selfie at Govt. Junior College Madhura Nagar College Pledge


SafaiMitra Suraksha Shivir

Health Check-up for Staff

NCB Ahmedabad

NCB Ahmedabad Unit

NCB Ahmedabad testing laboratory was established in 2001 at Ahmedabad and undertook testing jobs for cement, construction and allied industries within India. NCB Ahmedabad testing laboratory achieved a hallmark when NABL accredited them in the year 2017 and since then, the quality of testing services is maintained through NABL accreditation. The laboratory is BIS recognized, ISO certified facilitating smooth and efficient operations with state-of-art instrumental facilities to carry out the tests. NCB Ahmedabad Unit has essential facilities for testing of cement, concrete, steel and soil in order to provide Quality Assurance and Quality Control (QA-QC) and Third Party Quality Assurance (TPQA) services to the construction industry. Unit providing testing and TPQA services to various Government agencies of Gujarat, Union Territory (UI) of Daman & Diu and Dadra & Nagar Haveli. The following facilities are available with testing lab in Ahmedabad:

- Cement and Cementitious Materials such as OPC, PPC, PSC, Fly ash, Slag, Silica-fume etc.
- Aggregates – Complete physical analysis
- Soil – Complete physical analysis for classification of soil

NCB Ahmedabad Testing Laboratory undertake complete physical, chemical, analyses of various types of cement, Pozzolana, admixtures, water and physical analyses of aggregate, concrete, bricks, coal, reinforcement etc as per National and International standards.

Services Offered at NCB Ahmedabad

Testing Facilities Available for the Following Materials

- Cement and Cementitious Materials such as OPC, PPC, PSC, Fly ash, Slag, Silica-fume etc.
- Aggregates – Complete physical analysis
- Special Concrete, Advance Concrete Composite & Standard Concrete Mix Designs
- Ordinary concrete, standard concrete and High Strength Concrete using OPC, PPC, PSC, OPC + fly ash, OPC + Fly ash + silica fume etc.
- Soil – Complete physical analysis for classification of soil
- Reinforcement – Complete physical analysis of steel up to 32 mm dia reinforcement

- Water & Admixture – Complete chemical analysis

Concrete Technology Services Offered

- Evaluation of concrete making materials like Cement and Cementitious Materials such as OPC, PPC, PSC, Fly ash, Slag, Silica-fume etc., aggregates, etc.
- Mix design for ordinary, special and advanced concrete like high strength concrete, self-compacting concrete, pavement quality concrete, dry lean concrete etc.
- Studies on fresh properties and mechanical hardened properties of concrete.
- Service life design & durability studies on concrete including accelerated tests for carbonation induced corrosion, alkali aggregate reactivity, chloride induced corrosion, sulphate attack etc. These studies are taken up in collaboration with NCB Ballabgarh.

Structural Assessment & Rehabilitation Services Offered

- In-situ quality assessment, durability investigation and residual life assessment of concrete structures.
- Distress investigations of buildings, bridges, dams, power plants, chimney, silo etc. deteriorated due to aggressive environment or fire damaged structure.
- Consultancy for repairs/rehabilitation & retrofitting can be done in collaboration with NCB Ballabgarh.
- Load testing and assessment of load carrying capacity of structural members can be done in collaboration with NCB Ballabgarh.

Studies Undertaken for Structural Assessment & Rehabilitation for the year 2024-25

- Carry out Structural Stability using Non Destructive Evaluation Technique for Stability and visual conditional Evaluation for Minor Bridge at Shelti Goratpada DNH- Public Works Department, Silvassa (Shelti Minor Bridge Site).

Construction Technology & Management Services Offered

- Technical Audit (TA), Quality Assurance & Quality Control (QA/QC) and Third Party Quality Audit (TPQA) of new constructions- residential, commercial &; institutional buildings; flyovers, concrete roads, bridges etc.
- Third Party Inspection and Monitoring for construction projects such as Buildings, Roads, Underpasses, Over Bridges, Drains, Causeway etc. of OIDC & PWD at Daman Diu & Dadra Nagar Haveli (Union Territory).
- Third Party Audit & Quality Assurance for Retrofitting, Reconstruction of Health care facility buildings and other allied works for Project Implementation Unit & Roads & Buildings Department (Government of Gujarat)

- Technical Audit and Quality Assurance including testing of materials, repairs, retrofitting, reconstruction of building etc. for major reconstruction projects of earthquake affected areas for Gujarat State Disaster Management Authority (GSDMA)
- Third Party Inspection (TPI) for Quality Assurance and Inspection of Materials for Sports Infrastructure Project of Sports Authority of Gujarat in Gujarat region.
- Third party Technical Supervision, Monitoring & Quality Assurance for construction of new yard including building, road, earth works, fire Hydrant System, Water supply, Strom Water Drain, Electro Mechanical works, Landscaping and ancillary works for The Agricultural Produce Market Committee-Amreli & Rajkot, Gujarat.
- Third Party Inspection (TPI) For Quality Assurance and Inspection for various structures of Narmada main canal, branch canal, distributaries, minor canal etc. at various sites of Sardar Sarovar Narmada Nigam Limited in Gujarat region.

Studies undertaken for Construction Technology & Management for the year 2024-25

- Third Party Inspection and Monitoring (TPIM) for the work of Construction of New High Level Bridge across Damanganga River at Rakholi (EPC Mode) in the District of UT of Dadra & Nagar Haveli (D&NH), SilvassaThird Party Inspection and Monitoring (TPIM) for the work of Construction of High Level Bridge across river Damanganga at Athal on Silvassa Naroli Road (EPC Mode) in the District of UT of Dadra & Nagar Haveli (D&NH), Silvassa.
- Third Party Inspection and Monitoring (TPIM) for the work of Construction of High Level Bridge across river Damanganga at Athal on Silvassa Naroli Road (EPC Mode) in the District of UT of Dadra & Nagar Haveli (D&NH), Silvassa.

A glimpse of Laboratory Activities at NCB-Ahmedabad

Testing Facility of Compressive Strength of Concrete Cube and Cement Mortar Cube

Temperature Controlled Condition for Cement Testing Unit

Chemical Testing Laboratory

Testing Facility for Physical Analysis of Coarse & Fine Aggregate

Universal Testing Machine for Reinforcement Testing facility at NCB Ahmedabad Unit

A glimpse of Third Party Inspection & Quality Assurance project at NCB-Ahmedabad

Third Party Inspection and Monitoring (TPIM) for the work of Construction of New High Level Bridge across Damanganga River at Rakholi (EPC Mode) in the District of UT of Dadra & Nagar Haveli (D&NH), SilvassaThird Party Inspection and Monitoring (TPIM) for the work of Construction of High Level Bridge across river Damanganga at Athal on Silvassa Naroli Road (EPC Mode) in the District of UT of Dadra & Nagar Haveli (D&NH), Silvassa

Third Party Inspection and Monitoring (TPIM) for the work of Construction of High Level Bridge across river Damanganga at Athal on Silvassa Naroli Road (EPC Mode) in the District of UT of Dadra & Nagar Haveli (D&NH), Silvassa

Carry out Structural Stability using Non Destructive Evaluation Technique for Stability and visual conditional Evaluation for Minor Bridge at Shelti Goratpada DNH- Public Works Department, Silvassa (Shelti Minor Bridge Site).

NCB Bhubaneswar

NCB Bhubaneswar Unit

NCB Bhubaneswar was established during the year 2016 and the laboratory was set up in a space provided by IDCO, Odisha at Mancheswar Industrial Estate. NCB has established material testing laboratory in the above shed referred as Independent Testing Laboratory (ITL), NCB Bhubaneswar and the same has been got accredited through NABL for both Mechanical & Chemical parameters in testing of building materials.

NCB Bhubaneswar Unit Expansion

During the year 2022, NCB has procured about 1.0-acre land including a shed of an area of 3600 sqft. from IDCO, Odisha for Construction of Research & Laboratory facility (G+2) [expandable to G+4 as per the requirements] to setup full-fledged laboratory and office to provide technical services, testing and skill development services to Cement Industries & construction sector in the state of Odisha and neighbouring states. Registration of allotted land was done on 05 Jan 2023. MoU was entered between NCB and CPWD Bhubaneswar for construction of Research & Laboratory building(G+2) as deposit work. Building Works Committee (BWC) after several interactions has finalized the plans and accordingly CPWD commenced the construction work Bhoomi Pooja was done on 14 June 2024 in the August presence of DG,NCB. CE CPWD, Bhubaneswar and UiC NCB Bhubaneswar and other NCB Bhubaneswar staff were present in the occasion.

Bonomi Pooja dt 14.06.2024 for NCB Bhubaneswar's Research & Laboratory building

Laboratory infrastructure view of NCB Bhubaneswar



Activities of NCB Bhubaneswar

There are, at present, mainly four activities/services carried at NCB Bhubaneswar Unit viz.

1. Independent Testing Laboratory (ITL)- Building Material Testing Services
2. Third Party Quality Assurance (TPQA)- Quality Assurance and Audit Services
3. Structural Assessment and Rehabilitation (SAR)-Condition Assessment of Structures

The above activities are illustrated below:

Independent Testing Laboratory (ITL):

ITL is involved in testing ofconstruction materials for industry- supported projects. The Chemical Laboratory was established to provide technical support to the cement industry in Odisha and its neighboring states like West Bengal, Jharkhand, Bihar, Chhattisgarh and Northeast Indian states.

Testing facilities available at ITL NCB Bhubaneswar are listed below:

1. **Mechanical Testing Laboratory of Building Materials**

   Laboratory for Mechanical Testing of Hydraulic Cement, Hardened Concrete, Building Bricks, Coarse Aggregate, Fine Aggregate, Soil, Tiles, Granite, Paver Blocks, Marble, CC Chequred Tiles, AAC Blocks etc. NABL Accreditation (TC-9004) and re accreditation was obtained.

   Building Materials Testing services have been extended to various clients including, NBCC, CPWD, NTPC, Paradip Port Authority , H &UD , OSRTC, Odisha Industrial Infrastructure Development Corporation (IDCO). , OBCC, Bridge & Roof, Rites etc., and for various Cement Factories in Odisha and Neighboring States.

2. **Chemical Testing Laboratory of Cement and Cementitious Materials**

   Chemical testing laboratory for hydraulic cement (OPC, PPC, PSC, composite cement), cement-based materials (Flyash, Slag), construction water, etc. NABL Accreditation (TC-9004) obtained.

Mechanical & Chemical Laboratory:

Various Precast Paver block samples under testing at Laboratory

View of Concrete Testing Laboratory

View of Chemical Testing Laboratory

View of Concrete Mix design Laboratory

Visit of DPIIT officials to NCB Bhubaneswar

Visit of Sh Prashant Rana, SO DPIIT to review of activities under Swachhata Hi Seva 2024 at NCB Bhubaneswar dt 27.09.2024

Visit of Sh Diwakar Sharma, SO DPIIT to review of activities under Special Swachhata Campaign 4.0 at NCB Bhubaneswar dt 04.11.2024

Building Material's Testing -Clientele

- Cement Plants like Nuvoco, JSW, Sagar Cement, Dalmia, Shree Cements, JK Lakshmi
- OSRTC, Odisha
- H&UD, Odisha
- NTPC Sipat
- NTPC Kaniha
- NBCC, Odisha
- Paradip Port Authority, Odisha
- Various Municipal Bodies, Odisha

TPQA Projects

- Currently NCB Bhubaneswar is providing TPQA services to NBCC Odisha through MoU [For 5 Years w.e.f Aug 2022] for various projects in Odisha
- TPQA Projects of M/s Paradip Port Trust Ltd, Odisha
- TPQA Projects of M/s OSRTC, Odisha

STRUCTURAL ASSESSMENT AND REHABILITATION (SAR) [Ongoing Projects]		
1	SP-0	Condition Assessment using Non-Destructive and Partial destructive evaluation technique for OHPC at OPTCL Finance Building, Janpath, Bhubaneswar
THIRD PARTY QUALITY ASSURANCE (TPQA) [Ongoing Projects]		
1	SP- 6551	Third Party Quality Inspection for the work of Establishment of Science Academy in Panikoili Area, Jajpur, Odisha.
2	SP- 6554	Third Party Quality Inspection for the work of "Development of Urban Forest in KNDA area under Vyasanagar Municipality for Pollution Control measures, Jajpur, Odisha.
3	SP-0	Development of Iron Ore plot at IOHP measuring 20,000Sqm area in phase of 5000Sqm-Phase-II, Paradip Port Authority, Paradip, Odisha
4	SP-0	Construction of Compound wall, drain adjacent tp PMR and along RRS-I & II Tracks at MCHP area, Paradip Port Authority, Paradip, Odisha
5	SP-0	Providing Concrete Road from TT6 Junction (MCHP) to new Flyover and Reparing of Bitumen Surface in front of MCHP

		Workshop inside Harbour area. Paradip Port Authority, Paradip, Odisha
6	SP-0	Construction of Stadium, Guest House, Girls Hostel and Health Centre at National Law University, Cuttack in Odisha
7	SP-0	Construction of various in Phase-1(b) for IIT Bhubaneswar and its extended campus -Development of lecture Threatre Complex-2 and surrounding Development
8	SP-0	Construction of reservoir, intake well and pump house and ancilliary structure, supply, delivery, erection, testing and commissioning of related electromechanical and piping works including 1 month trial run and two years Operation and Maintainance. Paradip Port Authority, Paradip, Odisha
9	SP-0	Construction of compund wall, drain adjacent to PMR and along RRS-I & II tracks at MCHP area. Paradip Port Authority, Paradip, Odisha
10	SP-0	Providing Concrete road from TT6 Junction (MCHP) to new flyover and reparing of Bitumen surface in front of MCBHP workshop inside Harbour Area. Paradip Port Authority, Paradip, Odisha
SAR Completed Projects		
1	SP-6611	Condition Assessment-Overhead Steel Structure Water Tank at Malatipatpur, Bus Stand, Puri, Odisha.
TPQA Completed Projects		
1	SP- 6552	Third Party Quality Inspection for the work of Construction of Retaining Walls in the Stack yard (MCHP area) Paradip Port Authority, Paradip, Odisha
2	SP- 6553	Third Party Quality Inspection for the work of Construction and widening of Concrete Road, Retaining Walls etc. in Harbour area, Paradip Port Authority, Paradip, Odisha
3	SP- 6613	Third Party Quality Inspection for the work of Construction of Command & control Centre of OSRTC at Bhubaneswar, Odisha.
4	SP- 6628	Third Party Quality Audit for "Construction of Public Amenities (Building) at Sahadev Khuntha at-Balasore.

5	SP-6609	Third Party Quality supervision/control/assurance service for the works Repair and Maintenance to the net barrier from Gate No. 2 to Gate No.3, Paradip Port Authority, Paradip, Odisha
6	SP- 6610	Third Party Quality supervision/control/assurance service for the works Construction of approach road and drainage facility to new plot under development near outer bulb (BOT railway bulb located outside Gate No. 1from JSWPTPL tippler side, Paradip Port Authority, Paradip, Odisha
R&D Sponsored Project -Completed		
1	BH-CON1	Stress-Strain Behavior of High-Performance Geo Polymer Self Compacting Concrete Mix and its performance evaluation

Review of NCB Bhubaneswar Activities by DG

Unit In charge, NCB Bhubaneswar greeting MoS, Commerce and Industry, Govt. of India during the review of activities of various DPIIT departments at Bhubaneswar by MoS

Perspective view of the proposed Research & Laboratory Building


Status of Research & Laboratory Building

TPQA Activities photos




TPQA Inspections of Command and Control Center, OSRTC Bhubaneswar in Odisha




TPQA Inspections of Public Amenities Building in Sahadevkhunta Bus Stand, Balasore in Odisha

SAR Project Photographs




Condition Assessment of OHPC at OPTCL Finance Building

Condition Assessment of Utkal Univeristy Rural Campus, Siha, Chandikhole, Odisha

Condition Assessment of OPTCL Multi Storied Quarter complex

TPQA Inspections of Construction of Stadium, Guest House, Girls Hostel and Health Centre at National Law University, Cuttack in Odisha

Photos of TPQA Site Inspection of various project site at Paradip Port, Odisha

Published Research Papers

Published Research Papers

The following papers were contributed by NCB scientists in various Technical Journals/Magazines

Centre for Cement Research and Independent Testing – (CRT)

1. **Technology: Transformative Force**, Asok Kr. Dikshit, Richa Majumder, Sanjeev Kr. Chaturvedi and Lok Pratap Singh, India Cement Review (SGSC), Annual Issue 2024, P.82-86, India.

Centre for Construction Development and Research – CDR

2. **Fracture behavior of concrete made with sintered fly ash lightweight coarse aggregate in comparison to normal weight concrete**, Brijesh Singh, Shamsher Bahadur Singh, Sudhirkumar V. Bara, P N Ojha, Rohit Kumar. Online published on September 2024, http://dx.doi.org/10.17515/resm2024.310me0607rs

Centre for Mining, Environment, Plant Engineering and Operation – CME

3. **Chemical characterization of refuse derived fuel (RDF) using Py-GC/MS,** Sharma P, Sheth PN, Chourasia M, Mohapatra BN. Journal of Analytical and Applied Pyrolysis, 2024;179:106456.
4. **Overview of Energy Consumption and Attributes of Grinding Technologies in Indian Cement Industry,** Saurabh Bhatnagar and Anil K Popuri, ZKG Cement Lime Gypsum, 6-2024, pp 48-58.
5. **Prediction of HHV for fuel by Machine learning Algorethm Interpretablely analysis using Shopley Additive Explantion (SHSP),** Manish Sharma Timilsina, Subhadip She, Bibek Uprety, Voshishtha B Patel, Prateek Sharma, Pratik N Sheth, Fuel, 2024;129573

Papers Presented in Seminars and Workshops

The following papers were contributed / presented by NCB experts in different National and International Conferences, Seminars and Workshops:

Centre for Cement Research and Independent Testing – (CRT)

1. Studies on Development of Portland Dolomite Cement (PDC) using High MgO Limestone and Dolomitic Limestone Varsha Liju, Pinky Pandey, Diksha Rana, Mamta Pawar and S K Chaturvedi, 18th NCB International Conference & amp; Exhibition on Cement, Concrete and Building Materials, Vol.1, 27-29 November 2024, Yashobhoomi, IICC Dwarka, New Delhi, India.
2. Studies on Utilization of Industrial Waste for Carbon Capture. Varsha Liju, Diksha Rana, Gaurav Bhatnagar & S K Chaturvedi, 18th NCB International Conference & amp; Exhibition on Cement, Concrete and Building Materials,Vol.2, 27-29 November 2024, Yashobhoomi, IICC Dwarka, New Delhi, India.
3. Investigation of formulated chemical admixture using by product lignosulfonate from Indian paper and pulp industry in concrete to promote circular economy, A. K. Dikshit, Jitendra Singh, S K Chaturvedi, 18th NCB International Conference and Exhibition on Cement, Concrete and Building Materials, Vol.2, 27-29 November 2024, Yashobhoomi, IICC Dwarka, New Delhi, India.
4. Development of clinker standard materials through X-ray diffraction methodology for calibration using samples from different region of India, Asok K Dikshit, Giasuddin Ahamed, Jitendra Singh and Sanjeev K Chaturvedi, 18th NCB International Conference & Exhibition on Cement, Concrete and Building Materials, Vol.2, 27-29 November 2024, Yashobhoomi, IICC Dwarka, New Delhi, India
5. CO_2 Sequestration Potential of Various Industrial Waste and by-products, Richa Mazumder, Pinky Pandey, Giasuddin Ahamed, Sandip Gupta, Kalpana Sharma, A K Dikshit, Vol.2, 27-29 November 2024, Yashobhoomi, IICC Dwarka, New Delhi, India.
6. Utilization of By-Product Phosphogypsum as an Alternative Source of Mineral Gypsum in Cement Manufacturing in Favour of Circular Economy, Giasuddin Ahamed, Diksha Rana, G Jayachandra Naidu, Asok Kumar Dikshit, Toney Moses Rajan, Sanjeev K Chaturvedi and Lok Pratap Singh, 18th NCB International Conference & Exhibition on Cement, Concrete and Building Materials, Vol.3, 27-29 November 2024, Yashobhoomi, IICC Dwarka, New Delhi, India.
7. Estimation of Kaolinite Phase for the Quality Control of Clay by using Loss of Ignition, XRD, and DTA/TG Methods – A Comparative Study, Giasuddin Ahamed, G Jayachandra Naidu, Asesh Das, Ajay Kujur, Toney Moses Rajan, Richa Mazumder, Sanjeev K Chaturvedi and Lok Pratap Singh, 18th NCB International Conference & Exhibition on Cement, Concrete and Building

Materials,Vol.3, 27-29 November 2024, Yashobhoomi, IICC Dwarka, New Delhi, India.

8. Role of development of plant specific secondary Standards for XRF analysis of materials in cement Industry, Suresh Vanguri, G Prasad, A Sushmitha, P Janardhan, V Rama, B Panduranga Rao and S K Chaturvedi, Vol.2, 18th NCB International Conference & Exhibition on Cement, Concrete and Building Materials, 27- 29 November 2024, Yashobhoomi, IICC Dwarka, New Delhi, India

Centre for Mining, Environment, Plant Engineering and Operation – CME

1. First Success Story of National Council for Cement and Building Materials as PMC: Commissioning of Tyre Co-Processing System in Cement Plant at Oman, Anil Kumar Popuri, Kapil Kukreja, V Nagakumar and D K Panda. National Council for Cement & Building Materials
2. Rolling Back to Captive Power from Grid Power in Indian Cement Industry: Issues, Opportunities and Challenges, Prateek Sharma, Kapil Kukreja, Anand Bohra and Moon Chourasia. National Council for Cement & Building Materials
3. Strategy to Establish an Incubation Centre in 100 Days: A Case Study of National Council for Cement and Building Materials, Kapil Kukreja, Giassuddin Ahamed, Arup Ghatak and L. P Singh. National Council for Cement and Building Materials
4. Project Management & Execution Challenges for Setting up a Cement Plant in Emerging African Countries, Saurabh Bhatnagar, Kapil Kukreja, D K Panda, P R Rao, Kunal Reddy, Gabriel ITOUA. National Council for Cement and Building Materials, Promac Engineering Industries Limited, India and Embassy of The Republic of Congo in India
5. Diagnostic study for corrosion of ducts and stacks of cement plant, Anil Popuri, Anand Bohra, KPK Reddy, KRP Nath, Suresh Vanguri et.al. 18th NCB International Conference and Exhibition on Cement, Concrete and Building Materials, 27-29 November 2024, Yashobhoomi, Dwarka, Delhi, India.
6. Gasifier Design for Co-processing Refuse Derived Fuel in Cement Industry, Prateek Sharma, K.P.K. Reddy, Moon Chourasia, Choubey Raghav Shivkumar and Geetanjali. 18th NCB International Conference and Exhibition on Cement, Concrete and Building Materials, 27-29 November 2024, Yashobhoomi, Dwarka, Delhi, India.
7. Carbon Capture by Electrification of Calciner in the Cement Industry, Prateek Sharma, Ashish Gautam, Vinaykant and K P K Reddy. 18th NCB International Conference and Exhibition on Cement, Concrete and Building Materials, 27-29 November 2024, Yashobhoomi, Dwarka, Delhi, India.
8. Energy Audit & Process Optimisation of Captive Power Plant for a Cement Plant - A Case Study, Prateek Sharma and K P K Reddy. 18th NCB

International Conference and Exhibition on Cement, Concrete and Building Materials, 27-29 November 2024, Yashobhoomi, Dwarka, Delhi, India.

Centre for Construction Development and Research – CDR

1. Comparison of fracture behavior of geopolymer and hydraulic cement (OPC) based concrete, Brijesh Singh, P N Ojha & Amit Trivedi,10th International Conference on CONcrete under SEvere Conditions – Environment and Loading 2024, 25-27 September 2024, Chennai, India
2. Experimental Study on Creep Coefficient of Normal, High and Ultra-High Strength Concrete, P N Ojha and Brijesh Singh, 10th International Conference on CONcrete under SEvere Conditions – Environment and Loading 2024, 25-27 September 2024, Chennai, India
3. Performance of Portland limestone cements under sulphate environment, Puneet Kaura, Brijesh Singh, P N Ojha and L P Singh, 10th International Conference on CONcrete under SEvere Conditions – Environment and Loading 2024, 25-27 September 2024, Chennai, India
4. Carbonation and corrosion rate of concrete made with composite cement, P N Ojha & Puneet Kaura, 10th International Conference on CONcrete under SEvere Conditions – Environment and Loading 2024, 25-27 September 2024, Chennai, India
5. Comparison of Modulus of Elasticity for Structural Light Weight Concrete using Compressometer, Linear Variable Displacement Transducer and Extensometer, Brijesh Singh, Shamsher Bahadur Singh, S K Barai, P N Ojha, Rohit Kumar and Puneet Kaura. National Council for Cement and Building Materials and Birla Institute of Technology Pilani, 18th NCB International Conference and Exhibition on Cement, Concrete and Building Materials, 27-29 November 2024, Yashobhoomi, Dwarka, Delhi, India.
6. Effect of Period of Exposure to Fire on Mechanical Properties of TMT Bars, Brijesh Singh, Amit Trivedi, Amit Sagar, P N Ojha, Rohit Kumar and Amit Prakash. 18th NCB International Conference and Exhibition on Cement, Concrete and Building Materials, 27-29 November 2024, Yashobhoomi, Dwarka, Delhi, India.
7. Investigation of Mechanical and Durability Performance of Concrete Made with Flyash Limestone Composite Cement, Puneet Kaura, P N Ojha, Brijesh Singh and Amit Trivedi. 18th NCB International Conference and Exhibition on Cement, Concrete and Building Materials, 27-29 November 2024, Yashobhoomi, Dwarka, Delhi, India.
8. Impact of CO_2 Injection on Fresh and Hardened Properties of Concrete, Brijesh Singh, Mantu Gupta, Anand Bohra, Manish Mandre, P N Ojha and Sanjay Mundra, 18th NCB International Conference and Exhibition on Cement, Concrete and Building Materials, 27-29 November 2024, Yashobhoomi, Dwarka, Delhi, India.

9. Production of Ready Mix Geopolymer Concrete for Construction of Demo Structure, Amit Trivedi, Rajeev Goel, Rohit Kumar, Brijesh Singh, Arup Ghatak and Rakesh Kumar. 18th NCB International Conference and Exhibition on Cement, Concrete and Building Materials, 27-29 November 2024, Yashobhoomi, Dwarka, Delhi, India.

10. Performance of Structural Concrete using Electric ARC Furnace (EAF) Slag as a Fine Aggregate, P N Ojha, Puneet Kaura, Brijesh Singh and Arup Ghatak. 18th NCB International Conference and Exhibition on Cement, Concrete and Building Materials, 27-29 November 2024, Yashobhoomi, Dwarka, Delhi, India.

11. Load Test of an In-Situ Reinforced Alkali Activated Concrete Structure – A Case Study, Amit Trivedi, Brijesh Singh, P N Ojha, Arup Ghatak, Rohit Kumar, Lopamudra Sengupta and Abhijeet Landage. National Council for Cement and Building Materials, Research Scholar RCGSIDM-IIT Kharagpur and JSW Cement Limited, 18th NCB International Conference and Exhibition on Cement, Concrete and Building Materials, 27-29 November 2024, Yashobhoomi, Dwarka, Delhi, India.

12. Effect of Silica Fume, Flyash and Viscosity Modifying Admixture on Properties of 3D Printable Concrete, Amit Trivedi, Brijesh Singh, Manish Mandre, Rohit Kumar and P N Ojha. 18th NCB International Conference and Exhibition on Cement, Concrete and Building Materials, 27-29 November 2024, Yashobhoomi, Dwarka, Delhi, India.

13. Model Low-Cost Housing: Sustainable Technology for mass EWS, LIG and MIG Housing schemes, B.Pandu Ranga Rao, D.Pavan Kumar. International Conference on sustainable development: Generative AI and Multidisciplinary strategies, 22-23 December 2024

Centre for Quality Management, Standards and Calibration Services–CQC

1. Development of Ground Granulated Blast Furnace Slag CRM for Scientific and Industrial Application- S K Shaw, V Naga Kumar, A Agnihotri and Amit Trivedi. 18th NCB International Conference and Exhibition on Cement, Concrete and Building Materials, 27-29 November 2024, Yashobhoomi, Dwarka, Delhi, India.

2. A Study on Immersion Depth Behavior of Thermal Sensors- P Srikanth, V Naga Kumar, Bharat Ram and Amit Trivedi. 18th NCB International Conference and Exhibition on Cement, Concrete and Building Materials, 27-29 November 2024, Yashobhoomi, Dwarka, Delhi, India

Publication & Membership of Technical Committees

Representation of NCB Officials in Various Technical Committees

NCB is actively involved with a large number of overseas and Indian organizations in formulating and revising standards and policies through membership or otherwise. The Director General and other officials continued to serve on a number of committees constituted by the Government of India, the Bureau of Indian Standards, and other organizations as follows:

Dr. L P Singh, Director General

a) Member of Civil Engineering Divisional Council (CEDC) of Bureau of Indian Standards (BIS), Govt. of India

b) Chairman of Cement Sectoral Committee of Bureau of Energy Efficiency (BEE), Govt. of India.

c) Chairman of Cement Sectoral Committee for CCTS of Bureau of Energy Efficiency (BEE), Govt. of India

Dr. S K Chaturvedi, Joint Director

a) Member, Expert Appraisal Committee (EAC), Ministry of Environment, Forest and Climate Change, Govt. of India

b) Member, Cement and Concrete Sectional Committee (CED 2), Bureau of Indian Standards, New Delhi.

c) Member, CPCB Expert Committee, to finalize the draft guidelines for utilization of marble slurry.

d) Member, Panel for work relating to ISO/TC71 and ISO/TC74 (CED2/P1), Bureau of Indian Standards, New Delhi.

e) Member, Cement, Pozzolana and Cement Additives Subcommittee (CED 2:1), Bureau of Indian Standards, New Delhi.

f) Member, Panel for Revision of Cement Standards (CED 2:1/P1), Bureau of Indian Standards, New Delhi.

g) Member, Refractories Sectional Committee (MTD 15), Bureau of Indian Standards, New Delhi.

Dr. D K Panda, Joint Director

a) Member, Stones Sectional Committee (CED 6), Bureau of Indian Standards, New Delhi.

Sh. P N Ojha, Joint Director

a) Chairman, Cement Matrix Products Sectional Committee (CED 53), Bureau of Indian Standards, New Delhi.

b) Convenor, Panel for Revision of IS 2386 (CED 2:2/P10), Bureau of Indian Standards, New Delhi.

c) Member, Civil Engineering. Divisional Council (CEDC), Bureau of Indian Standards, New Delhi.

d) Member, Panel for Revision of Handbooks (CED 2/P2), Bureau of Indian Standards, New Delhi.

e) Member, Concrete Sub Committee (CED 2:2), Bureau of Indian Standards, New Delhi.

f) Member, Panel for Revision of IS: 456 and IS: 1343 (CED 2:2/P5), Bureau of Indian Standards, New Delhi.

g) Member, Cement and Concrete Sectional Committee (CED 2), Bureau of Indian Standards, New Delhi.

h) Member, Panel for work relating to ISO/TC71 and ISO/TC74 (CED2/P1), Bureau of Indian Standards, New Delhi.

i) Member, Panel for Aggregates from other than Natural Sources (CED 2/P3), Panel for aggregates from natural and other sources, CED 2:2/P8 and Revision of Cement Standards (CED 2:1/P1), Bureau of Indian Standards, New Delhi.

j) Member, Panel for Revision of IS 457 (CED 2:2/P6), Panel for Revision on Test Methods for Concrete (CED 2:2/P7) and Cement, Pozzolana and cement additives Subcommittee (CED 2:1), Bureau of Indian Standards, New Delhi.

k) Member, Structural Safety Sectional Committee (CED 37), Bureau of Indian Standards, New Delhi.

l) Member, Earthquake Engineering Sectional Committee (CED 39), Bureau of Indian Standards, New Delhi.

m) Member, National Building Code Sectional Committee (CED 46), Bureau of Indian Standards, New Delhi.

n) Member, Panel for Administration, Development Control Rules and General Buildings (CED 46:P1), Fire protection (CED 46:P2), Building Materials (CED 46:P3), Load, Forces and Effects (CED 46:P4), Soil and Foundation (CED 46:P5) and Plain Reinforced & Pre-stressed Concrete (CED 46:P8), Bureau of Indian Standards, New Delhi.

o) Member, Planning, Housing and Prefabricated Construction Sectional Committee (CED 51), Bureau of Indian Standards, New Delhi.

p) Member, Concrete Reinforcement Sectional Committee (CED 54), Bureau of Indian Standards, New Delhi.

q) Member CED 32, Code for Precast Concrete & 3D Printing, Bureau of Indian Standards, New Delhi.

Sh. Amit Trivedi, Joint Director

a) Member, Panel for work relating to ISO/TC71 and ISO/TC74 (CED2/P1),

b) Member, Panel for aggregates from other than Natural Sources (CED 2/P3), Panel for aggregates from natural & other sources, CED 2:2/P8, Panel for Ferrocement Construction, CED 2:2/P9, Panel for Revision of IS 2386 (CED 2:2/P10), Bureau of Indian Standards, New Delhi.

c) Member, Panel for Revision of IS 3370 (Part I & Part II) (CED 2:2/P1), Bureau of Indian Standards, New Delhi.

d) Member, Flooring, Wall Finishing and Roofing Sectional Committee (CED 5), Bureau of Indian Standards, New Delhi.

e) Member, National Building Code Sectional Committee (CED 46), Bureau of Indian Standards, New Delhi.

f) Member, Panel for Administration, Development Control Rules and General Buildings (CED 46:P1), Panel for Soil and Foundation (CED 46:P5), Panel for Masonry (CED 46:P7), Panel for Prefabrication and Systems Building (CED 46:P10), Bureau of Indian Standards, New Delhi.

g) Member, Planning, Housing and Prefabricated Construction Sectional Committee (CED 51), Bureau of Indian Standards, New Delhi.

h) Member, Cement Matrix Products Sectional Committee (CED 53), Concrete Pipes Sub Committee (CED 53:2) and Precast Concrete Products Sub Committee (CED 53:3), Bureau of Indian Standards, New Delhi.

i) Member, Concrete Reinforcement Sectional Committee (CED 54), Bureau of Indian Standards, New Delhi.

j) Member, Laboratory and RAMCO subcommittee, Bureau of Indian Standards, New Delhi.

k) Member, Laboratory Subcommittee and CASCO, Bureau of Indian Standards, New Delhi

l) Member, Code of Precast Concrete & 3D Printing, CED 32, Bureau of Indian Standards, New Delhi.

m) Member - Sub-committee 3 of CASCO-National Mirror Committee, Bureau of Indian Standards, New Delhi.

n) Member - MSD 20-Reference Materials Sectional Committee, REMCO, Bureau of Indian Standards, New Delhi.

o) Member - Laboratory and RAMCO subcommittee, Bureau of Indian Standards, New Delhi.

Sh. B P Ranga Rao, Joint Director

a) Member, Flooring, Wall Finishing and Roofing Sectional Committee (CED 5), Bureau of Indian Standards, New Delhi.

b) Member, Panel for Prefabrication and Systems Building (CED 46:P10), Bureau of Indian Standards, New Delhi.

c) Member, Water Proofing and Damp Proofing Sectional Committee (CED 41), Bureau of Indian Standards, New Delhi.

d) Member, SSD-06, Construction and related engineering services sectional committee, Bureau of Indian Standards, New Delhi

Sh. G J Naidu, General Manager

a) Member, Panel for Fire protection (CED 46: P2), Bureau of Indian Standards, New Delhi.

b) Member, Sieves, Sieving and other Sizing Methods Sectional Committee (CED 55), Bureau of Indian Standards, New Delhi.

Dr. Sanjay Mundra, General Manager

a) Member, Flooring, Wall Finishing and Roofing Sectional Committee (CED 5), Bureau of Indian Standards, New Delhi.

b) Member, Concrete Pipes Sub Committee (CED 53:2), Bureau of Indian Standards, New Delhi.

c) Member, CED 41- Waterproofing and Damp-Proofing, Bureau of Indian Standards, New Delhi.

Sh. B S Rao, General Manager

a) Member, Panel for Masonry (CED 46: P7), Bureau of Indian Standards, New Delhi.

Sh. Brijesh Singh, General Manager

a) Member (Young Professional), Cement and Concrete Sectional Committee (CED 2), Bureau of Indian Standards, New Delhi.

b) Member, Cement, Pozzolana & cement additives Subcommittee (CED 2:1), Concrete Sub Committee (CED 2:2), Panel for Revision of IS: 456 and IS: 1343 (CED 2:2/P5), Panel for Revision of Test Methods for Concrete (CED 2:2/P7), Revision of IS 2386 (CED 2:2/P10), Bureau of Indian Standards, New Delhi.

c) Member, Structural Safety Sectional Committee (CED 37), Bureau of Indian Standards, New Delhi.

d) Member, Earthquake Engineering Sectional Committee (CED 39), Bureau of Indian Standards, New Delhi

e) Member, Panel for Fire protection (CED 46:P2), Member, Panel for Load, Forces and Effects (CED 46:P4), Panel for Plain Reinforced & Pre-stressed Concrete (CED 46:P8), Bureau of Indian Standards, New Delhi.

f) Member, Fibre Reinforced Cement Product Sub Committee (CED 53:1), Bureau of Indian Standards, New Delhi.

g) Member, Concrete Reinforcement Sectional Committee (CED 54), Bureau of Indian Standards, New Delhi.

h) Member, CED 58, Sustainability of Built Environment Sectional Committee, Bureau of Indian Standards, New Delhi.

i) Member, working group on code of precast concrete & 3D Printing, CED 32, Bureau of Indian Standards, New Delhi.

Dr. Kapil Kukreja, General Manager

a) Member, Construction Plant and Machinery Sectional Committee (MED 18), Bureau of Indian Standards, New Delhi.

b) Member, Earth Moving Equipment and Material Handling (MED 7), Bureau of Indian Standards, New Delhi.

c) Member, Solid Waste Management Sectional Committee, EED-03 (CHD 33), Bureau of Indian Standards, New Delhi.

Sh. Suresh Kumar Shaw, General Manager

a) Member - MSD 20-Reference Materials Sectional Committee, REMCO, Bureau of Indian Standards, New Delhi.

Dr. (Mrs) Pinky Pandey, General Manager

a) Member, Building Limes Sectional Committee (CED 4), Bureau of Indian Standards, New Delhi.

Sh Amit Prakash, General Manager

a) Member, Masonry committee (CED 46:P7), Bureau of Indian Standards, New Delhi.

Sh. Ankur Mittal, General Manager

a) Member, Solid Mineral Fuels Sectional Committee (PCD 07), Bureau of Indian Standards, New Delhi.

b) Member, Coke Sub Committee (PCD 7:2), Bureau of Indian Standards, New Delhi.

c) Member, Coal Sub Committee (PCD 7:3), Bureau of Indian Standards, New Delhi.

d) Member, Coal serving as member Beneficiation & Lignite Sub Committee (PCD 7.6 and PCD 7.9), Bureau of Indian Standards (BIS)

Sh Mantu Gupta, Group Manager

a) Member, Panel for Revision of IS 457 (CED 2:2/P6), Bureau of Indian Standards, New Delhi.

b) Member working group for revision of IS: 6491 Method of Sampling of Flyash

Sh Manish Kumar Mandre, Group Manager

a) Member, Panel for Revision of IS 2386 (CED 2:2/P10), Bureau of Indian Standards, New Delhi.

b) Member, Code of Precast Concrete & 3D Printing, CED 32, Bureau of Indian Standards, New Delhi.

Sh. Anand Bohra, Group Manager

a) Member, Environment and Ecology Division Council (EEDC), Bureau of Indian Standards, New Delhi.

b) Member, Environmental Management Sectional Committee (EED 01), Bureau of Indian Standards, New Delhi.

c) Member, Environmental Pollution Control Sectional Committee (EED 02), Bureau of Indian Standards, New Delhi.

d) Member, Air Quality Sectional Committee (CHD 35), Bureau of Indian Standards, New Delhi.

e) Member, Environmental Services Sectional Committee (EED 05), Bureau of Indian Standards, New Delhi

f) Member, Carbon Dioxide Capture, Transportation, Utilization, and Storage (EED 10) , Bureau of Indian Standards, New Delhi

Dr. (Mrs) Varsha T Liju, Group Manager

a) Member, Cement Matrix Products Sectional Committee (CED 53), Bureau of Indian Standards, New Delhi.

Sh Amit Sagar, Group Manager

a) Member, Flooring, Wall Finishing and Roofing Sectional Committee (CED 5), Bureau of Indian Standards, New Delhi.

Sh. K P K Reddy, Group Manager

a) Member, Environmental Pollution Control Sectional Committee (EED 02), Bureau of Indian Standards, New Delhi.

Dr. Prateek Sharma, Group Manager

a) Member, Environmental Management Sectional Committee, EED-02 (CHD 34), Bureau of Indian Standards, New Delhi.

b) Member, Solid Waste Management Sectional Committee, EED-03 (CHD 33), Bureau of Indian Standards, New Delhi.

Sh. P Srikanth, Group Manager

a) Member, Laboratory and RAMCO subcommittee, Bureau of Indian Standards, New Delhi.

Sh Puneet Kaura, Group Manager

a) Member, Concrete Sub Committee (CED 2:2), Bureau of Indian Standards, New Delhi.

b) Member, Panel for Revision of IS: 456 and IS: 1343 (CED 2:2/P5), Bureau of Indian Standards, New Delhi.

c) Member, Panel for Revision of Indian Standards on Test Methods for Concrete (CED 2:2/P7), Bureau of Indian Standards, New Delhi

d) Member Working group (WG-2) of IS:456-2000

Sh Arup Ghatak, Group Manager

a) Member, Earthquake Engineering Sectional Committee (CED 39), Bureau of Indian Standards, New Delhi

Sh. Saurabh Bhatnagar, Group Manager

a) Member, Construction Plant and Machinery Sectional Committee (MED 18), Bureau of Indian Standards, New Delhi.

b) Member, Earth Moving Equipment and Material Handling (MED 7), Bureau of Indian Standards, New Delhi.

Sh. K R P Nath, Group Manager

a) Member, Air Quality Sectional Committee (CHD 35), Bureau of Indian Standards, New Delhi.

b) Member, Environmental Services Sectional Committee: SSD 07, Bureau of Indian Standards, New Delhi

Sh. V Naga Kumar, Group Manager

a) Member - Sub-committee 3 of CASCO-National Mirror Committee, Bureau of Indian Standards, New Delhi.

Sh. Giasuddin Ahamed, Group Manager

a) Refractories Sectional Committee (MTD 15), Bureau of Indian Standards, New Delhi.

Sh. Nikhil Kaushik, Manager

a) Member, Panel for Revision of IS 2386 (CED 2:2/P10), Bureau of Indian Standards, New Delhi.

Sh Y N Daniel, Manager

a) Member, Fibre Reinforced Cement Product Sub Committee (CED 53:1), Bureau of Indian Standards, New Delhi.

Sh. Abhishek Agnihotri, Deputy Manager

a) Member - Sub-committee 3 of CASCO-National Mirror Committee, Bureau of Indian Standards, New Delhi.

Sh. Gaurav Bhatnagar, Senior Assistant

a) Member, Solid Mineral Fuels Sectional Committee (PCD 07), Bureau of Indian Standards, New Delhi.

b) Member, Coke Sub Committee (PCD 7:2), Bureau of Indian Standards, New Delhi.

c) Member, Coal Sub Committee (PCD 7:3), Bureau of Indian Standards, New Delhi.

d) Member, Coal serving as member Beneficiation & Lignite Sub Committee (PCD 7.6 and PCD 7.9), Bureau of Indian Standards (BIS)

Finance and Accounts

Finance and Accounts

FINANCE

CONTRIBUTIONS

Ministry of Commerce & Industry Grant

During the year 2024-25, Grant of Rs. 20.50 Crores received.

FOREIGN EXCHANGE

During the year 2024-25, the Council earned Foreign Exchange amounting to US$ 94259.5 towards Training Fee, Testing Charges, Sponsored R & D, Seminar, Delegate Fee, Technical Exhibition Etc.

AUDITORS

M/s P C Chhajed & Co. Chartered Accountants, New Delhi were the Auditors of the Council for the year 2024-25.

ACCOUNTS

The Accounts for the 2024-25 duly audited by the Auditors of the Council are given at Annexure (Balance Sheet as at 31st March 2024 and Income & Expenditure Accounts for the year ended 31st March 2025).

INDEPENDENT AUDITORS' REPORT

To

The Members of National Council for Cement and Building Materials

Opinion

We have audited the accompanying financial statements of **National Council for Cement and Building Materials** ("the entity"). Which comprise the Balance Sheet as at March 31, 2025 and Income and Expenditure Account for the year then ended, and notes to accounts including a summary of significant accounting policies.

In our opinion and to the best of our information and according to the explanations given to us, the aforesaid financial statements give a true and fair view of the financial position of the entity as at March 31, 2025, and of its financial performance for the year then ended in accordance with the accounting standards issued by the Institute of Chartered Accountants of India (ICAI).

Basis of Opinion

We conducted our audit in accordance with the Standards on Auditing (SAs) issued by the Institute of Chartered Accountants of India (ICAI). Our responsibility under those standards are further described in the, "Auditor's Responsibility for the Audit of the Financial Statements" section of our report. We are independent of the entity in accordance with the code of Ethics issued by the ICAI and we have fulfilled our other ethical responsibilities in accordance with the code of ethics. We believe that the audit evidence we have obtained is sufficient and appropriate to provide the basis for our opinion.

Responsibilities of Management and Those Charged with Governance for the Financial Statements

Management is responsible for the preparation of these financial statements that give a true and fair view of the state of affairs, results of operations and cash flows of the entity in accordance with the Generally Accepted Accounting Principles in India. This responsibility includes the design implementation and maintenance of internal control relevant to the preparation and presentation of the financial statements that give a true and fair view and are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is responsible for assessing the entity's ability to continue as going concern, disclosing as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the entity or to cease operations, or has no realistic alternative but to do so.

Those Charged with Governance are responsible for overseeing the entity's financial reporting process.

Auditors' Responsibilities for the Audit of Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with SAs will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

We further report that:

a. We have obtained all the information and explanations which to the best of our knowledge and belief were necessary for the purpose of audit.
b. In our opinion proper books of account as required by law have been maintained by the entity as far as appears from our examination of these books.
c. The Balance Sheet and Income and Expenditure Account dealt with by this report are in agreement with the books of account.

For P C Chhajed & Co.
Chartered Accountants
Firm Registration No. 101800W

CA Gaurav Singh
Partner
Membership No. 545179
UDIN: 25545179BMKQXA2793

Place: New Delhi
Date: October 16th, 2025

National Council for Cement and Building Materials
Balance Sheet as at March 31, 2025

	Schedules		As at March 31, 2025		As at March 31, 2024
SOURCES OF FUNDS					
Capital Fund	A	6,80,76,146		6,80,76,146	
Reserves and Surplus	B	2,28,36,49,796		2,16,21,21,570	
Building Fund		45,00,000		45,00,000	
Gratuity Fund		7,96,66,812		8,87,18,480	
Provision For Leave Encashment		17,40,56,377		16,97,77,263	
Capital Grant from Govt of India	C	26,16,92,298		29,46,88,379	
Current Liabilities & Provisions	D	14,37,81,805	3,01,54,23,234	12,92,06,352	2,91,70,88,190
Total			**3,01,54,23,234**		**2,91,70,88,190**
APPLICATION OF FUNDS					
Fixed Assets					
Gross Block	E	1,14,49,75,284		1,04,22,04,697	
Less : Accumulated Depreciation		67,72,75,480	46,76,99,804	62,80,03,263	41,42,01,433
Lab Equipment Under Inspection			-		-
Gratuity Fund Investment					
(Fixed Deposit / Savings Bank / Interest Accrued)		16,16,45,426		15,60,33,981	
Leave Fund account		8,85,01,702		8,60,33,345	
Current Assets Loans & Advances					
R&D Contribution Outstanding		10,67,46,070		7,98,34,813	
Sundry Debtors	F	6,98,07,344		7,09,93,347	
(unsecured and considered good)					
Loans and Advances		24,27,14,456		19,98,28,725	
Cash and Bank Balances	G	1,80,17,64,353	2,47,11,79,351	1,86,22,23,207	2,45,49,47,418
FDR In lien			2,00,47,296		1,11,11,233
Interest Accrued on Bank Deposits			5,64,96,783		3,68,28,106
Total			**3,01,54,23,234**		**2,91,70,88,190**
Significant Accounting Policies	M				
Notes on Accounts	N				

The Schedules referred to above form an integral part of the Balance Sheet.
This is the Balance Sheet referred to in our report of even date.

For and on behalf of
P C Chhajed & Co.
Chartered Accountants
Firm Registration no.: 101800W

CA Gaurav Singh
Partner
M.No. 545179
New Delhi
Date:

Dr S K Chaturvedi
Joint Director
(Finance & Accounts)

Dr L P Singh
Director General

Shri Neeraj Akhoury
Chairman -NCB

National Council for Cement and Building Materials
Income and Expenditure Account for the Year Ended March 31, 2025

			For the Year ended 31 March 2025		For the Year ended 31 March 2024
INCOME					
Research & Development Contribution	**H**		32,06,39,858		23,94,73,872
Other Income	**I**		15,59,45,796		14,12,19,129
Grant-in-Aid (Revenue) from Ministry of Commerce & Industry	**J**		20,50,00,000		22,11,00,000
			68,15,85,654		**60,17,93,000**
EXPENDITURE					
Employee's Cost	**K**		34,94,89,899		31,12,07,262
Travelling & Conveyance (Including Overseas Travelling)			89,59,785		91,85,421
Lab. Stores Serv.& Comp.(S.W.)			72,27,712		69,28,239
Symposia & Seminars			3,05,52,644		10,94,743
Training Programmes			5,94,213		35,25,476
Repairs and Maintenance			1,31,66,001		1,33,17,172
Other Expenses	**L**		46,76,99,804		2,58,54,575
Depreciation		5,07,63,201		3,57,64,328	
Less : Transfer from Capital Grant from Govt of India		3,29,96,081	1,77,67,120	2,32,46,813	1,25,17,515
			45,17,69,014		**38,36,30,403**
Surplus for the year before tax			22,98,16,640		21,81,62,598
Less: Current Tax & Prior Period Tax			10,82,88,414		1,50,44,612
Surplus for the year after tax transferred to Reserve Fund			**12,15,28,226**		**20,31,17,986**
Significant Accounting Policies	M				
Notes on Accounts	N				

The Schedules referred to above form an integral part of the Income and Expenditure Account.
This is the Income and Expenditure Account referred to in our report of even date.

For and on behalf of
P C Chhajed & Co.
Chartered Accountants
Firm Registration no.: 101800W

CA Gaurav Singh
Partner
M.No. 545179
New Delhi
Date:

Dr S K Chaturvedi
Joint Director
(Finance & Accounts)

Dr L P Singh
Director General

Shri Neeraj Akhoury
Chairman -NCB

National Council for Cement and Building Materials
Schedules Forming Part of the Accounts as at March 31, 2025

Particulars	As at March 31, 2025 (Amount in Rs.)	As at March 31, 2024 (Amount in Rs.)
SCHEDULE - A		
Capital Fund		
As per the last Balance Sheet	6,80,76,146	6,80,76,146
Includes UNIDO Equipment valued at Rs 20,187,535 (Previous Year Rs 20,187,535) (Refer Note 3 (b) of Schedule M)		
TOTAL	**6,80,76,146**	**6,80,76,146**
SCHEDULE - B		
Reserves and Surplus		
As per the last Balance Sheet	2,16,21,21,570	1,95,90,03,584
Add: Surplus for the year	12,15,28,226	20,31,17,986
TOTAL	**2,28,36,49,796**	**2,16,21,21,570**

National Council for Cement and Building Materials
Schedules Forming Part of the Accounts as at March 31, 2025

Particulars	As at March 31, 2025 (Amount in Rs.)	As at March 31, 2024 (Amount in Rs.)
SCHEDULE - C		
Capital Grant from Govt of India		
As per the last Balance Sheet	29,46,88,379	31,79,35,192
Add : Plan Grant received during the year	-	-
	29,46,88,379	31,79,35,192
Less : Grant transferred to Income & Expenditure Account to the extent depreciation charged during the year on assets purchased out of capital grant	3,29,96,081	2,32,46,813
TOTAL	**26,16,92,298**	**29,46,88,379**
SCHEDULE - D		
Current Liabilities and Provisions		
Retention & Security Money	1,22,61,448	1,37,34,930
Other Liabilities	13,15,20,357	11,54,71,422
TOTAL	**14,37,81,805**	**12,92,06,352**

National Council for Cement and Building Materials

Depreciation as at 31 March 2025

SCHEDULE - E **(Amount in Rs.)**

	GROSS BLOCK							DEPRECIATION											NET BLOCK	
PARTICULARS	Cost upto March 31, 2001	Cost from April 1, 2001 to March 31, 2024	Total cost as at March 31, 2024	Addition During the Year 2024-2025	Disposal/ Adjustment out of cost before 2001 2024-2025	Disposal/ Adjustment out of cost after 2001 2024-2025	Total cost as at March 31, 2025	On Old Assets Upto March 31, 2001	On Assets from April 1, 2001 to March 31, 2024	Op.Bal Depreciation as at April 1, 2024	Rate %	On Assets Prior to 1 Apr 01 during the year 2024-2025	Rate %	On Additions after 1 Apr 01 2024-2025	Amortised During the leave preiod	Depreciation/ Adjustment on cost before 2001 2024-2025	Dep. / Adj. on cost after 2001 2024-2025	Total Depreciation as at March 31, 2025	WDV As at March 31, 2025	WDV As at March 31, 2024
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		16	17	18	19	20
LAND (FREE HOLD)	3924748		39,24,748				39,24,748	-	-	-									39,24,748	39,24,748
VEHICLES	833717	87,05,084	95,38,801	8,27,200		16,10,906	87,55,095	8,19,756	60,99,946	69,19,702	20.0	2,792	15.0	4,96,863.00			14,90,988	59,28,369	28,26,726	26,19,099
COMPUTER INCLUDING ACCESSORIES		5,99,04,488	5,99,04,488	47,29,261			6,46,33,749		5,67,28,734	5,67,28,734			40.0	31,62,006				5,98,90,740	47,43,009	31,75,754
FURNITURE AND OFFICE EQUIPMENTS	10263037	4,42,19,053	5,44,82,090	42,51,605			5,87,33,695	98,81,657	1,43,78,025	2,42,59,682	10.0	38,138	10.0	34,09,263				2,77,07,083	3,10,26,611	3,02,22,409
LABORATORY EQUIPMENT	80559050	43,98,83,910	52,04,42,960	7,20,91,091			59,25,34,051	7,73,19,730	32,46,65,216	40,19,84,946	10.0	3,23,932	15.0	2,80,96,468				43,04,05,346	16,21,28,705	11,84,58,015
MOBILE Quality Control Laboratory	0	52,68,489	52,68,489				52,68,489		52,33,653	52,33,653			15.0	5,225				52,38,878	29,611	34,836
CENTRE FOR CONTINUING EDUCATION			-				-			-								-	-	
BUILDINGS	1922707	4,21,19,827	4,40,42,534				4,40,42,534	12,55,955	2,05,64,017	2,18,19,972	2.5	16,669	10.0	21,55,581				2,39,92,222	2,00,50,312	2,22,22,562
OTHER SERVICES	535144	2,48,31,247	2,53,66,391	33,60,365			2,87,26,756	5,28,718	2,36,54,930	2,41,83,648	10.0	643	15.0	6,80,502				2,48,64,793	38,61,963	11,82,743
SOLAR PWOER PLANT		36,24,650	36,24,650	1,71,70,337			2,07,94,987		28,33,773	28,33,773			40.0	71,84,486				1,00,18,259	1,07,76,728	7,90,877
LABORATORY PROJECTS			-				-			-								-	-	
BUILDINGS	27973919	10,33,20,921	13,12,94,840	19,51,634		21,79,025	13,10,67,449	1,83,63,200	4,40,26,825	6,23,90,025	2.5	2,40,268	10.0	59,48,072			4,14,015	6,81,64,350	6,29,03,099	6,89,04,815
																		-		
CAPITAL WORK IN PROGRESS BULDG .			-				-			-								-	-	
(PG) UNDER CONST		14,08,02,902	14,08,02,902				14,08,02,902			-								-	14,08,02,902	14,08,02,902
LAND LEASED 1 ACRE FROM IDCO		1,50,00,000	1,50,00,000			(10,65,240)	1,60,65,240		5,61,303	5,61,303							5,61,303	-	1,60,65,240	1,44,38,697
LEASE HOLD BUILDING		42,22,098	42,22,098			(11,13,785)	53,35,883		1,57,992	1,57,992							1,57,992	-	53,35,883	40,64,106
OTHER SERVICES	10046554	58,56,725	1,59,03,279				1,59,03,279	99,20,085	55,19,765	1,54,39,850	10.0	12,647	15.0	50,544				1,55,03,041	4,00,238	4,63,428
STAFF HOUSING	8386427		83,86,427				83,86,427	54,89,984		54,89,984	2.5	72,411						55,62,395	28,24,032	28,96,443
																		-	-	
																		-	-	
																		-	-	
																		-	-	
																		-	-	
Total	14,44,45,303	89,77,59,394	1,04,22,04,697	10,43,81,493	-	16,10,906	1,14,49,75,284	12,35,79,085	50,44,24,179	62,80,03,264		7,07,500		5,11,89,010	-	-	26,24,298	67,72,75,476	46,76,99,808	41,42,01,434

National Council for Cement and Building Materials
Schedules Forming Part of the Accounts as at March 31, 2025

Particulars	As at March 31, 2025 (Amount in Rs.)	As at March 31, 2024 (Amount in Rs.)
SCHEDULE - F		
Sundry Debtors (Unsecured and Considered Good)		
Others	6,98,07,344	7,09,93,347
TOTAL	**6,98,07,344**	**7,09,93,347**
SCHEDULE - G		
Cash and Bank Balances		
In Fixed Deposits	1,64,60,74,716	1,74,60,63,256
In Saving Accounts	15,53,75,609	11,59,18,476
Cash in hand including postage imprest	3,14,028	2,41,475
UNESCO Coupons (US Dollar 132.10)	-	-
TOTAL	**1,80,17,64,353**	**1,86,22,23,207**

National Council for Cement and Building Materials
Schedules Forming Part of the Accounts as at March 31, 2025

Particulars	As at March 31, 2025 (Amount in Rs.)	As at March 31, 2024 (Amount in Rs.)
SCHEDULE - H		
Research and Development		
Sponsored Research and Development	15,05,99,028	14,50,47,013
Contribution		
Standardisation and calibration	5,48,45,540	5,81,15,391
Symposia & Seminars	7,07,89,249	18,70,850
NCB Proficiency Testing Programme	4,44,06,041	3,44,40,618
TOTAL	**32,06,39,858**	**23,94,73,872**
SCHEDULE - I		
Other Income		
Interest	13,64,14,872	12,59,74,025
Sale of Publications	-	212
Training Programmes	57,54,495	1,61,24,782
Miscellaneous Receipts	14,45,153	16,99,963
Foreign Exchange Fluctuation	3,49,841	(12,435)
Licence Fee (Housing Colony)	6,26,762	8,42,755
Interest on Income Tax Refund	13,29,588	-
Sale of Condemned Item Income	1,05,085	12,89,107
Reversal of Prior Period Income	-	(46,99,281)
GRANT IN AID - BEE (BUREAU OF ENERGY EFFICIENCY)	99,20,000	
TOTAL	**15,59,45,796**	**14,12,19,129**
SCHEDULE - J		
Grant from Ministry of Commerce & Industry		
Towards Non-Plan Grant from Cement Cess	20,50,00,000	22,11,00,000
Grants from Ministry of Environment		-
TOTAL	**20,50,00,000**	**22,11,00,000**

National Council for Cement and Building Materials
Schedules Forming Part of the Accounts as at March 31, 2025

Particulars	As at March 31, 2025 (Amount in Rs.)	As at March 31, 2024 (Amount in Rs.)
SCHEDULE - K		
Employee's Cost		
Establishment Charges	32,83,34,408	28,35,23,894
Contribution to Provident Fund & other Fund	2,21,62,065	2,06,13,878
Gratuity (Refer Note 4 of Schedule - M)	(36,63,912)	48,32,401
Social Security & Welfare	26,57,339	22,37,089
TOTAL	**34,94,89,899**	**31,12,07,262**
SCHEDULE - L		
Other Expenses		
Rent, Rates and Taxes	32,87,432	28,39,544
Electricity and Water Charges	70,30,474	84,37,481
Foreign Exchange Fluctuation	-	-
Postage, Telegrams & Telephones	17,69,756	23,77,486
Publications	82,113	51,702
Stationery & Miscellaneous Stores	20,70,223	22,20,224
Books, Periodicals and Membership Fee	13,95,247	9,74,720
Exhibition, Publicity and Advertisements	1,96,510	5,52,316
Legal Expenses	18,88,860	8,52,925
Patents	2,71,000	4,45,000
Audit Fees - Statutory Auditors	5,83,758	3,10,000
Bank Charges	2,75,256	70,172
Insurance of Assets	1,60,089	13,88,067
Sundry Expenses	37,40,923	45,41,387
Collaborative Assistance in R&D and	12,60,000	7,93,550
TOTAL	**2,40,11,640**	**2,58,54,575**

National Council for Cement and Building Materials
Schedules forming part of the Accounts as at March 31, 2025

SCHEDULE – M

SIGNIFICANT ACCOUNTING POLICIES

1. **The accounts are prepared on a going concern basis as per the historical cost convention.**

2. **Recognition of Income:**

   (a) Income from Sponsored Research & Development Contribution is accounted for on the basis of the percentage of work completed during the year.

   (b) Other Incomes, other than Technical Services Fees, are accounted for on accrual basis.

3. **Fixed Assets:**

   (a) Fixed Assets are recorded at cost and for the better presentation of financial statements. During the Financial year 2020-2021, the Council has decided to change the depreciation rates and has adopted the rate of depreciation of Income Tax Act 1961 for all block of assets prospectively i.e. rates as per Income Tax Act 1961 will be applied on the written down value and the additions made from the financial year 2020-21 onwards. Old rate of depreciation will continue to apply for assets purchased upto financial year 2000-2001. Depreciation is charged on written down value basis.

   Rate of depreciation is as follows:

		Old Rates % p.a	Rates as per Income Tax Act 1961 % p.a.
*	Vehicles	20	15
*	Office Furniture and Equipment	10	10
*	Laboratory Equipment	10	15
*	Laboratory Projects Services	10	15
*	Building including Staff Housing	2.5	
	i) Residential Property		5
	ii) Other than Residential Property		10
*	Computers -		40
*	Solar Power Plant -		40

   Depreciation has been provided on assets for whole year irrespective of the date of addition.

(b) Fixed Assets include Laboratory Equipment and Energy Bus received free of cost & custom duty from the United Nations Industrial Development Organisation (UNIDO). The value adopted in the accounts is as per customs CIF assessment upon import or at value advised by UNIDO and the corresponding credit for this amount is included under Capital Fund (Refer Schedule A) Rs. 19,564,057 for Laboratory Equipment and Rs. 623,478 for Energy Bus. The title to these assets has been transferred to Government of India and the further transfer of these fixed assets from the Ministry of Commerce & Industry, Government of India to the Council is pending. However, the Council provides depreciation on these fixed assets in accordance with the rates noted in para 3 (a) above.

(c) The organization had entered into a contract with IDCO during FY 2022–23 for the purpose of executing a lease agreement in the future and had paid certain consideration in this regard. As the lease agreement has not yet been finalized, the related assets have been appropriately classified under Capital Work-in-Progress (CWIP). Further, it was observed that certain costs amounting to Rs. 21,79,025, earlier debited to the Building (other than IDCO Building) account, were incorrectly allocated. Accordingly, necessary adjustments have been made, and the said amount has been reallocated to IDCO Land (CWIP) and IDCO Building (CWIP) in proportion to their respective revised costs.

Following the reallocation, the updated balances are as follows:

IDCO Land (CWIP): Rs. 1,60,65,239.92

IDCO Building (CWIP): Rs. 53,35,883.08

This impact has been duly reflected and appropriately dealt with in the Fixed Assets Schedule.

4. Liability for Gratuity and Leave Encashment is provided for on the basis of actuarial valuation.

5. Accounting for Government Grants:

(a) Government Grant of Revenue nature received from the Government have been accounted for as Income for the year under the Income and Expenditure Account.

NATIONAL COUNCIL FOR CEMENT AND BUILDING MATERIALS
Schedules forming part of the Accounts as at March 31, 2025

SCHEDULE – N

NOTES ON ACCOUNTS

1. Purchases made during the year in respect of laboratory stores, raw materials, miscellaneous consumable stores, publications, tools and accessories are charged to the Income and Expenditure Account and closing stock of these items has not been ascertained or accounted for, as per the decision of the Board of Governors.

2. Fixed Asset Register has been updated with the complete details along with value which is to be reconciled with the Accounts. Physical verification of the Fixed Assets has been carried out in each Centre/Group.

3. Contingent liabilities not provided for in respect of:

   a. Claims not acknowledged as debts by the Council, the liability of which is not ascertainable as pending in various Courts.

   b. Claim for interest by the Andhra Pradesh State Government in 1998, for delay in payment for purchase of Land (amount not intimated).

4. Gratuity Fund Investment has a balance of Rs.16,16,45,426-(Rs. 15,60,33,981/-). There is a shortfall of Rs. Nil (Rs. Nil) in the "Gratuity Fund Investment Account" as compared to the "Gratuity Fund account" as at 31st March 2025.

5. The Council has got an actuarial valuation of the leave encashment for and upto the year ended 31st March 2025 and the liability computed is Rs. 17,40,56,377/- (Rs. 16,97,77,263/-).

6. An amount of Rs. 6,31,976 has been deposited with Hon'ble Delhi High Court in connection with a case filed by a former employee. Necessary adjustment will be made after the decision of the Hon'ble Court.

7. R&D Contribution has been received during the year FY 2024-25 of Rs. 10,67,46,070 (Rs. 7,98,34,813/-).

8. During the year 2024-25, the council earned foreign exchange amounting to Rs. 80,66,070/- (Rs. 37,34,834/-).

9. Expenditure in foreign currency during the year 2024-25 is Rs.1,16,25,410 /- (Rs. 1,57,972/-).

10. As on 31.03.2024, there are certain ledgers/accounts which have been pending for reconciliation/settlement with the net debit balance of more than Rs. 11.03 Crore (approx.) since the last many years. These unreconciled ledgers may include the ledgers coming under the heads of sundry debtors, creditors, loans

and advances and service tax. The Management has taken a note of it and is working for reconciliation and settlement.

11. There are some unreconciled/unidentified receipts amounting to Rs 5.04 Crores which probably could have been received from sundry debtors whose accounts are pending for reconciliation and settlement. Management is trying to reconcile/identify the parties from whom the payments have been received and also in process of taking constructive steps to mitigate such payments. For the purpose of disclosure, the amount of Rs 5.04 Crore has been deducted from the balance of sundry debtors.

12. In the past years, organization had implemented the project of Government of Karnataka under which a credit balance of Rs. 40.76 Crores and a debit balance of Rs. 40.36 Crores is showing in the books and the respective ledgers are pending for reconciliation. The management has taken a note of this and the accounts will be put up for settlement and necessary accounting entries will be passed in the books.

13. Previous year's figures have been regrouped and rearranged wherever necessary so as to conform to this year's classification.

Institutional Events

Institutional Events

National Technology Day 2024

NCB celebrated National Technology Day 2024 on 10th May 2024. Prof. B. Bhattacharjee, Emeritus Professor, IIT Delhi, Chief Guest on the occasion addressed NCB officials on "Net zero carbon challenges and way out for cement and construction".

World Environment Day 2024

NCB celebrated World Environment Day on 5th June 2024. Dr Mohammad Rihan, Director General-National Institute of Solar Energy was the Chief Guest and Dr Anjan Ray, Former Director, CSIR-IIP was the Guest of Honour on the occasion.

Chief Guest of the occasion Dr Mohammad Rihan, Director General-NISE explained the importance of energy conservation, efficiency and shift to green energy.

Dr Anjan Ray, Former Director, CSIR-IIP gave a presentation on the impact of industrial activities on environment and ways to reduce the impacts.

International Yoga Day 2024

NCB celebrated 10th International Yoga Day on 21st June 2024 to promote physical, mental & spiritual well-being. Dr S K Chaturvedi, Joint Director & Secretary-NCB welcomed Ms Kusum Bhagat, Secretary, Yoga Vigyan Manav Kalyan Trust on the occasion.

NCB Staff enthusiastically participated in the event and performed Yoga and pranayam under the supervision of Ms Kusum Bhagat.

78th Independence Day 2024

78th Independence Day celebrated on 15 August 2024 at NCB Ballabgarh. Dr. L P Singh, DG-NCB hoisted the National Flag, distributed sweets, flags and addressed the NCB staff & their family members.

एक पेड़ मां के नाम

Under the campaign "एक पेड़ मां के नाम", NCB planted tree saplings on 21 August 2024 at its Ballabgarh premises, aimed to raise awareness on environment conservation through sapling plantation.

Blood Donation Camp

Ministry of Health and Family Welfare, Govt of India (MoH&FW) has launched a campaign to organise Mega Blood Donation camp on 17th September 2024, aiming to collect aims one lakh units of blood from Voluntary blood donors on a single day. The campaign slogan of the event is "Celebrating 20 years of giving: Thank you, blood donors". NCB organised a Blood Donation Camp on 17th September 2024.

Swachhata Hi Seva 2024

Swachhata Hi Seva 2024 campaign was observed at NCB from 17th September to 2nd October 2024.

Special Swachhta Campaign 4.0

Swachhta Special Campaign 4.0 was observed at NCB from 2nd October to 31st October 2024 Shri Sumit Dalal, SO, DPIIT, Govt. of India visited NCB Ballabgarh office to review the activities undertaken during the campaign.

हिन्दी पखवाड़ा

हिन्दी पखवाड़े का शुभारंभ

राष्ट्रीय सीमेंट एवं भवन सामग्री परिषद्, बल्लभगढ़ कार्यालय में हिन्दी पखवाड़ा 17 सितंबर 2024 से 30 सितम्बर 2024 के बीच बड़े उत्साह के साथ मनाया गया। पखवाड़े का शुभारंभ आदरणीय डॉ लोक प्रताप सिंह महानिदेशक, एनसीबी, के कर कमलों द्वारा डॉ एस के चतुर्वेदी, संयुक्त निदेशक, डॉ डी के पंडा, संयुक्त निदेशक, श्री पीएन ओझा, संयुक्त निदेशक, श्री अमित त्रिवेदी, संयुक्त निदेशक, डॉ संजय मुंदरा, महाप्रबंधक, श्री जी जयचंद्र नायडू, महाप्रबंधक एवं डॉ कपिल कुकरेजा की उपस्थिति में किया गया। पखवाड़े का शुभारंभ करते हुये महानिदेशक महोदय ने सभी अधिकारियों / कर्मचारियों को कार्यालय में राजभाषा के प्रचार-प्रसार को बढ़ावा देने के लिए अधिक से अधिक कार्य हिन्दी में करने के लिए प्रोत्साहित किया तथा उन्होंने इस तरह के आयोजनों को कार्यालय की कार्यक्षमता और संवाद में हिंदी के प्रयोग को प्रोत्साहित करने का माध्यम बताया। इस अवसर पर डॉ कपिल कुकरेजा, समूह प्रबंधक द्वारा रचित काव्य संग्रह 'तिरंगा' का विमोचन महानिदेशक महोदय, डॉ लोक प्रताप सिंह द्वारा किया गया।

हिन्दी पखवाड़े 2024 के अंतर्गत कार्यालय में निम्नलिखित प्रतियोगितायें आयोजित की गई जिनमें कार्यालय के अधिकारियों / कर्मचारियों ने बढ़-चढ़कर भाग लिया। प्रतियोगिताओं का उद्देश्य प्रतिभागियों की हिंदी भाषा कौशल को उभारना और उन्हें भाषा के विभिन्न आयामों से परिचित कराना था।

- निबंध प्रतियोगिता
- टिप्पणी लेखन प्रतियोगिता
- हिंदी प्रश्नोत्तरी प्रतियोगिता
- कविता पाठ प्रतियोगिता
- अनुवाद एवं श्रुतलेखन / सुलेख प्रतियोगिता

हिंदी पखवाड़े का समापन समारोह

एनसीबी कार्यालय में दिनांक 30 सितम्बर 2024 को हिन्दी पखवाड़ा समापन समारोह, पूरे उत्साह के साथ डॉ संजीव कुमार चतुर्वेदी, इकाई प्रभारी एवं संयुक्त निदेशक की अध्यक्षता में आयोजित किया गया तथा उन्होंने सभी प्रतिभागियों को उनके उत्साह और प्रयास के लिए सराहा और इस प्रकार के कार्यकर्मों के निरंतर आयोजित करने की आवश्यकता पर बल दिया। हिन्दी पखवाड़ा समापन समारोह के अवसर पर कविता पाठ प्रतियोगिता आयोजित की गई। जिसमें कार्यालय के कर्मचारियों व अधिकारियों ने उत्साहपूर्वक भाग लिया और सुंदर व रुचिपुर्ण कविताओं का पाठ किया। पखवाड़े के समापन समारोह के दौरान प्रतियोगिताओं में भाग लेने वाले विजेताओं के नामों की घोषणा की गई जिन्हें कार्यालय के वार्षिक दिवस के अवसर पर पुरस्कृत किया गया।

एनसीबी कार्यालय में हिंदी बैठकों का आयोजन

एन.सी.बी. बल्लभगढ़ कार्यालय में समिति की प्रथम हिन्दी बैठक माननीय महानिदेशक महोदय की अध्यक्षता में दिनांक 26.06.2024 को आयोजित की गई तथा गत तिमाही की हिंदी प्रगति रिपोर्ट की समीक्षा माननीय महानिदेशक महोदय द्वारा की गई व महोदय ने सभी से हिंदी के प्रचार - प्रसार पर बल देने का आग्रह किया।

एन.सी.बी. बल्लभगढ़ कार्यालय में समिति की द्वितीय हिन्दी बैठक आदरणीय श्री परमानंद ओझा, संयुक्त निदेशक एवं केंद्र प्रमुख अध्यक्षता में दिनांक 26.07.2024 को आयोजित की गई। उक्त बैठक में कार्यायलीन कार्यों में हिंदी के प्रयोग की समीक्षा की गई व हिंदी पखवाड़े के आयोजन के संबंध में भी चर्चा की गई।


एन.सी.बी. बल्लभगढ़ कार्यालय में समिति की तृतीय हिन्दी बैठक माननीय महानिदेशक महोदय की अध्यक्षता में दिनांक 05.11.2024 को आयोजित की गई। बैठक में हिंदी के प्रगामी प्रयोग से संबंधित विभिन्न मदों पर चर्चा की गई।


एन.सी.बी. बल्लभगढ़ कार्यालय में समिति की चतुर्थ हिन्दी बैठक माननीय महानिदेशक महोदय की अध्यक्षता में दिनांक 04.02.2025 को आयोजित की गई। बैठक के दौरान तिमाही में किए गए कार्यों का अवलोकन किया गया व कार्यालय में हिंदी से संबंधित अन्य मदों पर भी चर्चा की गई। बैठक में उपस्थित सदस्यों ने भी हिंदी के पक्ष में अपने विचार रखें।


एनसीबी कार्यालय में आयोजित हिंदी कार्यशालाएं

एनसीबी कार्यालय में "कम्प्युटर पर हिन्दी टंकण कार्य करने हेतु "हिन्दी इंडिक इनपुट टूल की जानकारी" विषय पर दिनांक 28 जून 2024 को हिन्दी कार्यशाला का आयोजन किया गया। उक्त कार्यशाला में एनसीबी राजभाषा कार्यान्वयन समिति द्वारा कार्यशाला में उपस्थित सभी कार्मिकों को राजभाषा नियम, अधिनियम के संबंध में जानकारी प्रदान की गई व यूनिकोड के माध्यम से कम्प्युटर में हिंदी टाइपिंग के संबंध में भी मार्गदर्शन किया


एनसीबी कार्यालय में दिनांक 25 सितम्बर 2024 को "भारत सरकार की राजभाषा नीति और हमारे दायित्व" विषय पर कार्यशाला का आयोजन किया गया। कार्यशाला की अध्यक्षता आदरणीय श्री जी जे. नायडू, केंद्र प्रमुख, सी.आई.एस. द्वारा की गई। इस कार्यशाला में मुख्य वक्ता के रूप में डॉ. देवेन्द्र तिवारी, वरिष्ठ प्रबंधक (राजभाषा), नराकास, एनएचपीसी, फ़रीदाबाद उपस्थित रहें। कार्यशाला के दौरान मुख्य वक्ता डॉ देवेंद्र तिवारी ने हिन्दी के प्रयोग की आवश्यकता और राजभाषा नीति को सशक्त रूप में लागू करने के महत्व पर अपने विचार रखें तथा कार्यशाला में उपस्थित सभी कार्मिकों को राजभाषा हिंदी के संबंध में महत्वपूर्ण जानकारी प्रदान की।


एनसीबी कार्यालय में 'हिंदी त्रैमासिक प्रगति रिपोर्ट में ध्यातव्य बिंदु' विषय पर दिनांक 12 नवम्बर 2024 को हिन्दी कार्यशाला का आयोजन किया गया। कार्यशाला के दौरान राजभाषा हिंदी के विभिन्न बिन्दुओं पर एनसीबी राजभाषा कार्यान्वयन समिति द्वारा प्रकाश डाला गया व कार्मिकों की प्रत्येक तिमाही में भरी जाने वाली हिंदी प्रगति रिपोर्ट से संबंधित शंकाओं का भी निवारण किया गया। कार्यशाला पूर्णत: सफल रही।

एनसीबी कार्यालय में 25 मार्च 2025 को "निरीक्षण प्रश्नावली एवं हिंदी प्रगति रिपोर्ट संबंधी शंका निवारण एवं समाधान" विषय पर कार्यशाला का आयोजन किया गया। कार्यशाला की अध्यक्षता आदरणीय डॉ लोक प्रताप सिंह, महानिदेशक, एनसीबी द्वारा की गई। इस कार्यशाला में मुख्य वक्ता के रूप में आदरणीय श्री बाबू लाल मीना जी, उप - निदेशक (राजभाषा), वाणिज्य और उद्योग मंत्रालय, उद्योग संवर्धन और आंतरिक व्यापार विभाग (डीपीआईआईटी) भारत सरकार को आमंत्रित किया गया। मुख्य अतिथि वक्ता श्री बाबू लाल मीना जी ने अपने संबोधन में कहा कि राजभाषा हिन्दी केवल भारत ही नही अपितु समस्त विश्व में पहचान बनाने में कामयाब हुई है। उन्होने राजभाषा हिंदी के प्रचार - प्रसार हेतु राजभाषा विभाग द्वारा चलाई जा रही विभिन्न योजनाओं के बारे में बताया तथा महोदय द्वारा संशोधित तिमाही प्रगति रिपोर्ट और संसदीय राजभाषा समिति के विषय में सभी को जानकारी प्रदान की गई व कार्मिकों की तिमाही प्रगति रिपोर्ट संबंधी शंकाओं का भी निवारण किया। इस कार्यक्रम ने हिन्दी के महत्व व संवैधानिक दायित्व को समझने और उसके प्रयोग को बढ़ावा देने में महत्वपूर्ण योगदान दिया।

एन.सी.बी दर्पण अंक-5 का विमोचन

एनसीबी कार्यालय के वार्षिक दिवस के अवसर पर एनसीबी द्वारा प्रकाशित हिंदी वार्षिक गृह पत्रिका 'एनसीबी- दर्पण अंक-5' का विमोचन माननीय श्री माधव के सिंघानिया, संयुक्त प्रबंध निदेशक, सीईओ, जे के सीमेंट के कर कमलों द्वारा एवं डॉ लोक प्रताप सिंह, महानिदेशक एनसीबी, डॉ संजीव कुमार चतुर्वेदी, संयुक्त निदेशक एवं सचिव-एनसीबी की उपस्थिति में दिनांक 23 दिसम्बर 2024 को बल्लभगढ़ ईकाई में किया गया।

हिन्दी शिक्षण योजना

राजभाषा विभाग, गृह मंत्रालय हिन्दी शिक्षण योजना के सत्र (जनवरी - मई 2024) में कार्यालय के 14 परीक्षार्थियों ने प्रबोध परीक्षा अच्छे अंको से उत्तीर्ण की।

प्रवीण परीक्षा में उत्तीर्ण कार्मिकों के लिए जनवरी - मई 2025 सत्र के लिए प्राज्ञ पाठ्यक्रम की कक्षाएं दिनांक 02.01.2025 से एनसीबी कार्यालय में संचालित की जा रही है। हिंदी शिक्षण योजना का मुख्य उद्देश्य कार्मिकों को हिन्दी में दक्ष बनाकर अधिकाधिक कार्यालयीन कार्य हिन्दी में करने के लिये प्रेरित करना है। प्राज्ञ पाठ्यक्रम की कक्षाओं के शुभारंभ के अवसर पर महानिदेशक महोदय द्वारा प्रवीण पाठ्यक्रम उत्तीर्ण कार्मिकों को प्रमाण-पत्र प्रदान किये गए।

अखिल भारतीय राजभाषा सम्मेलन में एनसीबी कार्यालय की भागीदारी

राजभाषा विभाग, गृह मंत्रालय द्वारा चतुर्थ अखिल भारतीय राजभाषा सम्मलेन का आयोजन भारत मंडपम, नई दिल्ली में किया गया। जिसमें कार्यालय से श्रीमती रश्मि गुप्ता, उप-प्रबंधक, श्रीमती पूनम कनौजिया, सहायक प्रबंधक एवं श्री लखन, कनिष्ठ हिंदी सहायक द्वारा भाग लिया गया।

एनसीबी कार्यालय में हिंदी प्रश्नोत्तरी प्रतियोगिताओं का आयोजन

एनसीबी कार्यालय में हिंदी भाषा के प्रचार -प्रसार हेतु समय-समय पर विभिन्न प्रतियोगियाओं का आयोजन किया जाता है। इसी क्रम में कार्यालय में 25.09.2024 व 25.03.2025 क्रमश: राजभाषा हिंदी से संबन्धित प्रश्नोत्तरी प्रतियोगिताओं का आयोजन किया गया। जिसमें कार्यालय के लगभग सभी कार्मिकों ने उत्साहपूर्वक भाग लिया तथा प्रतियोगिता में सही उत्तर देने वाले प्रतिभागियों को कार्यालय द्वारा प्रोत्साहन पुरुस्कार से पुरस्कृत किया गया।


नराकास के अंतर्गत हिन्दी संगोष्ठी का आयोजन

नराकास के अंतर्गत आयोजित हिन्दी संगोष्ठी का आयोजन दिनांक 26-03-2024 व 22-08-2024 को किया गया, जिसमें एनसीबी कार्यालय की ओर से श्री लखन जी, कनिष्ठ हिन्दी सहायक द्वारा भाग लिया गया।


हिंदी संपर्क अधिकारियों की बैठक का आयोजन

दिनांक 26 जुलाई 2024 को नराकास (का.) फ़रीदाबाद में हिंदी संपर्क अधिकारियों की बैठक का आयोजन किया गया जिसमें एनसीबी कार्यालय से श्रीमती पूनम कनौजिया, सहायक प्रबंधक एवं श्री लखन, कनिष्ठ हिंदी सहायक द्वारा भाग लिया गया।


कार्यालय में नराकास द्वारा निबंध प्रतियोगिता का आयोजन

नगर राजभाषा कार्यान्वयन समिति (नराकास), फरीदाबाद के तत्वाधान में दिनांक 11 -14 नवम्बर 2024 में राजभाषा हिन्दी को बढ़ावा देने हेतु आयोजित हिन्दी प्रतियोगिताओं के अंतर्गत हिन्दी निबंध प्रतियोगिता का आयोजन एनसीबी, बल्लभगढ़ परिसर में दिनांक 12 नवम्बर 2024 को किया गया जिसमें कार्यालय के साथ साथ अन्य नराकास से संबंधित कार्यालयों के प्रतिभागियों ने भाग लिया।

नराकास, फरीदाबाद, द्वारा छमाही बैठकों का आयोजन

दिनांक 28 मई 2024 को नराकास (का.) फ़रीदाबाद की प्रथम छमाही बैठक में कार्यालय से आदरणीय डॉ संजीव कुमार चतुर्वेदी, संयुक्त निदेशक एवं केंद्र प्रमुख तथा श्रीमती पूनम कनौजिया, सहायक प्रबंधक द्वारा भाग लिया गया।

दिनांक 17 दिसम्बर 2024 को नराकास (का.) फ़रीदाबाद की द्वितीय छमाही बैठक में कार्यालय से श्रीमती रश्मि गुप्ता, उप-प्रबन्धक तथा श्रीमती पूनम कनौजिया, सहायक प्रबंधक द्वारा भाग लिया गया।

नराकास, फरीदाबाद, राजभाषा शील्ड प्रतियोगिता में प्रोत्साहन पुरस्कार (वर्ष 2023-24)

नगर राजभाषा कार्यान्वयन समिति (का.), फ़रीदाबाद द्वारा आयोजित शील्ड प्रतियोगिता में विगत वर्षों की भांति वर्ष 2023-24 के लिए भी दिनांक 17 दिसम्बर 2024 को राष्ट्रीय सीमेंट एवं भवन सामग्री परिषद्, बल्लभगढ़ को प्रोत्साहन पुरस्कार से सम्मानित किया। श्रीमती पूनम कनौजिया, सहायक प्रबंधक एवं श्रीमती रश्मि गुप्ता, उप-प्रबन्धक ने शील्ड प्रतियोगिता का पुरस्कार ग्रहण किया।

नराकास, फरीदाबाद, द्वारा हिंदी संगोष्ठी एव राजभाषा हीरक जयंती समारोह का आयोजन

नराकास फ़रीदाबाद के तत्वाधान में आयोजित हिंदी संगोष्ठी एवं राजभाषा हीरक जयंती समारोह में कार्यालय से श्रीमती पूनम कनौजिया, सदस्य सचिव, राजभाषा कार्यान्वयन समिति एवं श्रीमती रश्मि गुप्ता, सदस्या द्वारा भाग लिया गया।

National Unity Day

To commemorate the birth anniversary of Shri Sardar Vallabh bhai Patel, Rashtriya Ekta Diwas (National Unity Day) will be celebrated at NCB on 31st October 2024. On the occasion of NCB officials took National Unity Day Pledge and paid tribute to Sardar Vallabhbhai Patel.

62nd NCB Day

NCB celebrated its 62nd NCB Day on 23rd December 2024 at its Ballabgarh campus. Shri Sanjiv Singh, Joint Secretary, Department for Promotion of Industry and Internal Trade, Government of India was the Chief Guest and Shri Madhav Singhania, Joint MD & CEO, JKCement was the Guest of Honour on the occasion.

Dr L P Singh, Director General-NCB informed that 500 kWp Solar Roof Top has been installed under the aegis of DPIIT to support the PM Surya Ghar

On the occasion, NCB's hindi magazine "NCB Darpan" was released. Winners of activities held under Hindi Pakhwada 2024, Swachhata Hi Sewa 2024, Special Swachhata Campaign 4.0, Vigilance Awareness Week, Cyber Swachhata Campaign were also awarded.

Inauguration of 500 kWp Solar Rooftop at NCB Ballabgarh

The Government of India has approved the PM Surya Ghar Muft Bijli Yojana on 29 th February, 2024 to increase the share of solar rooftop capacity. Under this Scheme, all Government Buildings Roofttops was targeted to be saturated with the Rooftop Solar to the extent that is technically feasible by 31st December 2025. Under the aegis of DPIIT, NCB has installed 500 kWp Solar Roof Top at its Ballabgarh campus. This will help in reduction of CO_2 emissions and electricity bills. Shri Sanjiv Singh, Joint Secretary, DPIIT, Govt of India in presence of Shri M K Singhania, Joint MD & CEO, J K Cement and Dr L P Singh, Director General, NCB inaugurated the 500 kWp Solar Roof Top facility at NCB's Ballabgarh Campus.

Inauguration of 500 kWp Solar Rooftop

76th Republic Day 2025

NCB celebrated 76th Republic Day on 26th January 2025. Dr L P Singh, Director General, NCB hoisted the National Flag, distributed sweets and addressed the NCB staff & their family members present on the occasion.

International Women's Day 2025

NCB celebrated International Women's Day on 7th March 2025. Dr. L P Singh, DG - NCB highlighted the social, political and economic achievements of women & their contribution in various fields. Dr. Sarita Garg, Ex-Chief General Manager (Lubricant Technology) Indian Oil Corporation Ltd. R&D Centre, Faridabad was the Guest of Honour on the occasion.

Interaction with Stakeholders

Interaction with Stakeholders

NCB signed an MoU with Manav Rachna International Institute of Research & Studies (MRIIRS)

NCB signed an MoU with Manav Rachna International Institute of Research & Studies (MRIIRS), Faridabad on 3rd May 2024. The MoU was signed by Dr L P Singh, Director General-NCB and Mr. Ramesh Nair, Registrar-MRIIRS in presence of Dr D K Panda, Joint Director-NCB, Dr Sanjay Mundra, General Manager-NCB, Dr Kapil Kukreja, Dr Sandeep Gupta and Dr. Geeta Nijhawan, Associate Dean-MRIIRS. This MoU aims at building cooperation and strengthening long-term collaboration for Research & Development between MRIIRS & NCB.

NCB signed an Memorandum of Agreement (MoA) with Bureau of Energy Efficiency (BEE)

NCB signed an Memorandum of Agreement (MoA) with Bureau of Energy Efficiency (BEE) to undertake Research and Development projects focused on:

i. Design of an Alternative Fuel dryer for Cement plants by utilizing cooler ESP vent air

ii. Process design and integration of RDF/biomass gasification to cement plant calciner to enhance alternative fuel utilization in Indian cement industry

iii. Detailed research study of solar thermal energy application (for medium temperature application (150 °C - 400 °C)) in Indian cement industry.

The MoA was signed by Dr L P Singh, Director General-NCB and Dr Ashok Kumar, Deputy Director General-BEE on 10th May 2024 at NCB Ballabgarh in presence of Dr S K Chaturvedi, Secretary-NCB; Dr D K Panda, Joint Director & Head-CME, NCB; Shri Amit Trivedi, Joint Director-NCB; Shri Brijesh Singh, Group Manager-NCB; Shri Ankur Mittal, Group Manager-NCB; Dr Kapil Kukreja, Group Manager-NCB, Dr Prateek Sharma, Manager-NCB; Shri Vivek Negi, Joint Director-BEE; Shri J S Kalra, PTSE-BEE; Shri Sanjay Singh-Shree Cement Ltd; Shri Avadh Mani Pandey-BEE, Shri Sudhanshu Singh-BEE and other officials of NCB and BEE.

NCB officials Visit to Republic of Congo

Prime Minister of Republic of Congo Anatole Collinet Makosso visited 600TPD Greenfield Cement Plant Project site at Louvakou district, the Republic of Congo. NCB is serving as Project Management Consultant for the Government of the RoC to setup 600TPD Greenfield Cement Plant Project site at Louvakou district, the Republic of Congo (RoC)

The Prime Minister of the Republic of Congo H.E Anatole Collinet Makosso, along with the Minister of Industrial Development and Private Sector Promotion, H.E A. TH Nicephore Fylla Saint-Eudes, and the Minister for Ministry of Energy and Hydraulics, H.E M. Emile Ouosso, visited the 600TPD Greenfield Cement Plant Project on 27th May, 2024.

During their visit, PM Makosso and his accompanying ministers toured the plant, including Crusher area, limestone storage shed, pyro section, and CCR (Central Control Room). Their inspection was characterized by a genuine appreciation for the progress made.

Exposure Visit of Future Entrepreneurs at NCB-Incubation Centre, Ballabgarh

As a part of fostering a deeper understating of government processes among the younger generation and cultivating the entrepreneurship culture from the school level itself. The Startup India team from the Department for Promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce, GoI along with students from multiple schools of NCR visited the NCB-IC.

Live demonstrations were given for technologies like drones used for carry out structural assessment as well as 3-D printing machines. The students were also explained about the cement manufacturing process and told about the challenges the industry faces today or is likely to face in the near future and how the Start-Up ecosystem is destined to play a pivotal role in the next decade by introducing the industry to disruptive and cost-effective technologies which shall further contribute towards the ultimate goal of Net Zero Emission by 2070.

Apart from Artificial Intelligence and Machine Learning (AI/ML) students were encouraged to search for avenues like substituting coal with Hydrogen or Alternative Fuels and newer technologies, methods, or even ideas that can capture CO_2 at a competitive cost.

The Startup India team appreciated the NCB-IC with the words i.e. "It is really inspiring to hear the story of how the incubator has been set-up in <100 days. The startups we saw had some groundbreaking innovations, and it was interesting to see how a traditional industry has adopted innovation so beautifully"

Visit of officials of DPIIT at NCB

Assistant Secretaries to Government of India and officials from Cement Section & Invest India, Department for Promotion of Industry and Internal Trade, Government of India visited National Council for Cement & Building Materials, Ballabgarh on 25th June 2024. The team visited the Cement and Concrete testing and research labs, Incubator Centre and Cement Plant Model at NCB.

Visit of officials of Novoco Vistas Corp Ltd. at NCB -IC

A team from Novoco Vistas Corp Ltd. comprising of Dr. Hemantkumar Aiyer (VP-Research) and Dr Arunachala Sadangi (AGM) visited NCB Incubation Centre on 9 July 2024 to explore various possibilities of Collaboration.

NCB signed an MoU with National Institute of Solar Energy (NISE)

National Council for Cement and Building Materials (NCB) signed an MoU with National Institute of Solar Energy (NISE) on 29 July 2024. The MoU was signed by Dr L P Singh, Director General-NCB and Dr. Mohammad Rihan, Director General-NISE in presence of Dr. Chandan Banerjee, DDG-NISE; Dr. Jai Prakash, DDG-NISE; Dr. Avadhesh Yadav, DDG-NISE; Dr Kapil Kukreja, Group Manager-NCB, and Dr Prateek Sharma, Manager-NCB.

This MoU aims at building cooperation and strengthening long-term collaboration for Research & Development between NISE & NCB.

NCB-IC signed agreement with four StartUps, viz., Biomimicry Technologies Pvt. Ltd., Concreed Solutions Pvt. Ltd., LivNSense GreenOps Pvt. Ltd. and Onelement Energy Pvt. Ltd.

21st August 2024, on the occasion of World Entrepreneurs' Day #udyamitadiwas, National Council for Cement and Building Materials - Incubation Centre (NCB-IC) signed agreement with four StartUps, viz., Biomimicry Technologies Pvt. Ltd., Concreed Solutions Pvt. Ltd., LivNSense GreenOps Pvt. Ltd. and Onelement Energy Pvt. Ltd.

These Startups are working in the field of waste water management solutions for construction industry, green chemistry based construction chemicals, AI/ML based solutions for cement industry and Carbon Capture & utilisation respectively.

The agreements were signed by Dr S K Chaturvedi, Joint Director & Secretary, NCB and founders of four startups in the presence of Director General-NCB, Dr. L. P Singh,

Head of Centers, Head of Services, Unit in Charges, NCB-IC Managing Committee members to formally induct the startups under NCB-IC's Incubation Program.

Founders of the newly incubated startups shared their vision and mission along with their future road map during the occasion. DG-NCB appreciated the ideas and innovative work being done by the startups and also congratulated them on being incubated under NCB-IC.

DG-NCB encouraged the startups and also assured all possible support from NCB to make their startup journey turn into a success story.

Visit to Sweden under LeadIT programme

As part of Indian delegation, Dr S K Chaturvedi, Joint Director, NCB visited Stockholm, Sweden under the Leadership for Industry Transition (Lead IT) programme jointly run by Govt. of India and Govt. of Sweden during 14th to 17th October 2024. The delegation included members from DPIIT, Cement Manufacturers Association (CMA), GCCA, Indian cement industry representatives from Dalmia cement, J K Cement, Sagar Cement, My home cement and UltraTech cement. Dr Chaturvedi participated in the Session on "Energy & India-Sweden Industry Transition Partnership – ITP".

NCB signed an MoU with Global Cement and Concrete Association, India (GCCA India)

National Council for Cement and Building Materials (NCB) signed an MoU with Global Cement and Concrete Association, India (GCCA India) on 28 November 2024. The MoU was signed by Dr L P Singh, Director General-NCB and Shri Manoj Rustagi, Director, GCCA India in presence of Shri Kaustabh Phadke, General Manager, GCCA India and Dr S K Chaturvedi, Secretary-NCB.

NCB signed an MoU with AIC-Institute of Plasma Research Plasmatech

National Council for Cement and Building Materials (NCB) signed an MoU with AIC-Institute of Plasma Research Plasmatech on 28 November 2024. The MoU was signed by Dr L P Singh, Director General-NCB and Dr Nirav Jamnapara, AIC-IPR Plasmatech in presence of Dr D K Panda, Joint Director NCB and Dr Prateek Sharma, Group Manager-NCB.

NCB officials visit to the Nano silica and sodium silicate manufacturing facility of M/s Aanya Chemical Pvt. Ltd. Sikanderabad, Uttar Pradesh

NCB team comprising Dr L P Singh, DG-NCB, Shri P N Ojha, HoC-Construction Development & Research, NCB, Shri Amit Trivedi, Joint Director, NCB and Shri Brijesh Singh, General Manager, NCB visited the Nano silica and sodium silicate manufacturing facility of M/s Aanya Chemical Pvt. Ltd. Sikanderabad, Uttar Pradesh on 13th February 2025. NCB team visited the facility to understand the manufacturing process and to explore the possibility of evaluating it's performance for application in concrete production.

Appendices

Appendix - I

Rolling Plan of Missions within the Framework of Centres

A. CENTRE – CEMENT RESEARCH AND INDEPENDENT TESTING (CRT)

Mission 1: Utilization of Marginal Grade Raw Materials in the Manufacture of Cement and Building

Mission 2: Development of Newer Cements, Composites and Alternate Binding and Building Materials

Mission 3: Development of Newer Processes of Manufacturing Cement and other Binding and Buildings Materials

Mission 4: Raw Mix Design Optimization

Mission 5: Utilization of Industrial and other Wastes for Cement and Building Materials

Mission 6: Development of Newer Refractories

Mission 7: Improved Refractory Engineering Practices

Mission 8: Study of Fundamental Concepts in Material Science and Fundamental Studies Relating to Areas of Fuel Combustion, Pyro-processing, Size Reduction, etc.

Mission 9: Independent Testing

B. CENTRE – MINING, ENVIRONMENT, PLANT ENGINEERING AND OPERATION (CME)

Mission 1: Compilation and Updating of National Inventory of Cement Grade Limestone Deposits

Mission 2: Identification, Exploration, Evaluation and Assessment of Limestone Deposits and other Cement Raw Materials

Mission 3: Upgradation and Quality Establishment of Limestone (at Quarries) and Mineral Conservation

Mission 4: Application of Remote Sensing Techniques

Mission 5: Advanced Survey Techniques including Geographical Information System (GIS) and Global Positioning System (GPS)

Mission 6: Application of Geophysical Techniques for Mineral Exploration, Ground Water Investigation, etc.

Mission 7: Mine Planning and Scheduling

Mission 8: Improved Machinery Application and Improved Technological Upgradation for Mining Practices

Mission 9: Sustainable Development through Environmental Improvement including Survey of Land and Water Resources.

Mission 10: Pollution Control Technologies for Particulate Gaseous Emissions and Liquid Effluents

Mission 11: Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) for Industrial Projects and Mines

Mission 12: Environmental Management System (EMS) and ISO - 14001 Certification for Process Industries

Mission 13: Utilization of Hazardous Wastes as Supplementary Fuel

Mission 14: Monitoring of Environmental Parameters for Water, Ambient Air Quality, Noise and Vibration Studies

Mission 15: Rehabilitation and Reclamation of Mined out Areas

Mission 16: Improving Capacity Utilization and Increasing the Rate of Production in Kilns and Mills towards Improving Total Factor Productivity in Cement Industry through Process Optimization, Diagnostic Studies and Trouble Shooting and Improvement in Operation

Mission 17: Benchmarks, Best Practices, Operational Norms and Technical Audit including Plant Monitoring

Mission 18: Productivity Enhancement Programme (PEP)

Mission 19: Technological Upgradation

Mission 20: Improving Utilization of Coals

Mission 21: Utilization of Alternate Fuels such as Lignite, Natural Gas, Combustible Wastes etc.

Mission 22: Improvements in Fuel Combustion Efficiency

Mission 23: Optimization of Energy (Both Thermal and Electrical) Consumption

Mission 24: Energy Auditing, Management and Monitoring

Mission 25: Waste Heat Utilization including Cogeneration

Mission 26: Creating Awareness and Motivation for Energy Conservation

Mission 27: Total Productive Maintenance (TPM)

Mission 28: Preventive/Predictive Maintenance Programme, Condition Monitoring Techniques and Tribology including Computerised Maintenance

Mission 29: Inventory Control and Spare Parts Management

Mission 30: Risk Analysis and Improving Safety in Cement Plants

Mission 31: Turnkey Consultancy for Setting up Modern Medium and Large Cement Plants from Concept to Commissioning including Fund Sourcing

Mission 32: Establishing Modern Energy Efficient CRI-MVSK and Rotary Kiln based Mini Cement Plants from Concept to Commissioning

Mission 33: Improvements in System Design and Engineering of Plant and Machinery (including CRI designed indigenous Precalcinator System, Burners for High Ash Coals, Refractory Lining System and Coal Quality Modulation System)

Mission 34: Modernization and Technological Upgradation in Cement Plants

Mission 35: Upgradation and Modification of VSK based Cement and Lime Plants

Mission 36: Developing Systems Designs for Bulk Movement of Cement by Rail, Road and Waterways

Mission 37: Marketing Strategies and Logistics

Mission 38: Improvements in Packaging of Cement

C. CENTRE – CONSTRUCTION DEVELOPMENT AND RESEARCH (CDR)

Mission 1: Analysis and Design of Structures for Safety and Economy and Development of Related Software Packages

Mission 2: Rationalizing Designs of Structures and Foundations in Cement Plants and Other Constructions

Mission 3: Performance Evaluation of Structures including Machine Foundations through Site Inspection and Testing

Mission 4: Formulation and Evaluation of Protective System for Enhancing the Service Life of Concrete Structures

Mission 5: Evaluation of Concrete Construction through Non-Destructive Investigations

Mission 6: Improving Durability of Concrete Construction through Distress Investigations and Rehabilitation Procedures

Mission 7: Improved Quality Control Procedures for Enhancing Durability

Mission 8: Rational Utilization of Cement and other Ingredients in Concrete, including Admixtures

Mission 9: Promotion of Ready Mix Concrete Technology in India

Mission 10: Development of Concrete for Special and Newer usages such as Underwater Concreting, Special Concrete Exposed to Extreme Temperature etc

Mission 11: Development and Evaluation of Prefab Systems Appropriate for Housing Programmes

Mission 12: Application of Alternative Building Materials and Development of Construction Techniques for Low Cost Housing

Mission 13: Improvements in Construction Technology of Cement Concrete Pavements and Canal Linings

Mission 14: Development of Precast Architectural Concrete Elements and Concrete Finishes

Mission 15: Preventive Maintenance Programme for Enhancing Service Life of Buildings

Mission 16: Extended Application of Concrete for Non-Structural Usage

Mission 17: Improvement in Construction Management Techniques

D. CENTRE – INDUSTRIAL INFORMATION SERVICES (CIS)

Mission 1: Collection, Documentation and Retrieval of Information for Development of Cement and Building Materials Industries

Mission 2: Establishing National Data Bank for the Cement and Building Materials Industries

Mission 3: Providing Library Services

Mission 4: Establishing Display Centre and Sample Museum and Participation in Exhibition and Trade Fairs

Mission 5: Publication of R & D Projects, Technology Digests, R & D Journals, Trend Reports, Promotional Literature etc

Mission 6: Organising Workshops and Seminars at National and International Levels on Topical Subjects in the Areas of Cement and Building Materials

Mission 7: Promoting International Linkages for Development of Technologies in the Field of Cement and Building Materials

E. CENTRE – CONTINUING EDUCATION SERVICES (CCE)

Mission 1: Improving the Talent of Personnel at Entry Level to Cement Industry

Mission 2: Improving Technical and Managerial Skills/Knowledge of NCB Officials through Inhouse/ External Programmes

Mission 3: Manpower Planning and Human Resource Development Strategies for Cement and Building Material Industries

Mission 4: Upgrading Technological Talent of Personnel in the Cement and Building Materials Industries

Mission 5: Improving Operational Skills of Personnel in the Cement Industry through Simulator Based Courses

Mission 6: Training of Personnel in Computer Programming, Application and Information Technology at Different Levels of Participation

Mission 7: Training of Personnel in Software Development, System Analysis and Information Technology Applicable to Cement Manufacturing Process Industry, Structural Design and Investigations

F. CENTRE – QUALITY MANAGEMENT, STANDARDS AN CALIBRATION SERVICES (CQC)

Mission 1: Providing Traceable Calibration Services to the Industry for Ensuring Manufacture of Quality Product

Mission 2: National and International Standardization

Mission 3: Quality Management, Quality Assessment and Quality Improvement in Cement and Building Materials Industries

Mission 4: Development of Improved Methodologies for Testing and Quality Control including Rapid Methods of Testing and Quality of Cement and Other Building Materials in the Field

Mission 5: Inter-Laboratory Proficiency Testing

Mission 6: Quality Related Services

Mission 7: Development of New Standard Reference Materials

Mission 8: Providing Standard Reference Materials (SRMs), Developed by NCB, to the Industry for Ensuring Accuracy of Testing for Quality Control

These Programmes and Missions are proposed to be achieved through the pursuit of specific projects with specified targets of time, cost and assured end products

Appendix II

Completed R&D Project Programme 2024–2025

Sl.	Project No.	Project title	Duration
1	WAU-19	Investigations on Utilization of Phospho- gypsum in Cement Manufacturing	Aug 2021- Jul 2024
2	COB-14	Development of methodology for estimation of kaolinite content in Indian quality clay	Apr 2023 - Mar 2025
3	SOD-13	Effect of fire on the residual mechanical properties of reinforcing bars and structural performance of reinforced concrete beams in flexure & Shear	Apr 2022 - Mar 2025
4	SAR-02	Evaluation of Concrete Surface Coatings for their effectiveness in service life enhancement of RCC elements under: Carbonation induced corrosion & Chloride Induced Corrosion	Oct 2022 - Sep 2025
5	CON-19	Utilization of CO_2 in fresh concrete and study on fresh and hardened properties of CO_2 induced concrete	Apr 2022 - Mar 2025
6	NCB-BH/CON1	Stress–Strain Behavior of High Performance Geo Polymer Self Compacting Concrete Mix and its Performance evaluation	Apr 2023 - Mar 2025
7	COB-18	Revision of NCB publication entitled "Norms for Proving Limestone Deposits for Cement Manufacture"	Apr 2024 - Mar 2025

Appendix –III

Sponsored Projects Completed During the Year 2024-25

National Council for Cement and Building Materials has completed 143 sponsored projects in the year 2024-25. Centre for Cement Research and Independent Testing (CRT) has completed 36 nos. of projects, Centre for Mining, Environment, Plant Engineering & Operation (CME) has completed 32 nos. of sponsored projects and Centre for Construction Development and Research (CDR) have completed 75 nos. of sponsored projects.

Centre for Cement Research and Independent Testing – (CRT)

Sl. No.	Name of Project	Sponsors
1.	Evaluation of burnability of raw mix	M/s Zuari Cement Ltd., Sitapuram Works, Suryapet, Telangana
2.	Evaluation of burnability of raw mix	M/s Ultra Tech Cement Ltd., Rawan Cement Works, Simga, Chattisgarh
3.	Establishing Limestone Consumption Factor	M/s UTCL, Maihar Cement Works, Sarla Nagar, Satna , M.P.
4.	Evaluation of burnability of raw mix	M/s Purbanchal Cement Ltd., Satutari, Sonapur Distt., Kamrup, Assam
5.	Evaluation of burnability of raw mix	M/s Sonadhi Cement Plant, Nuvoco Vista Corp Ltd., Baloda Bazar, Chattisgarh
6.	Evaluation of burnability of raw mix samples	M/s J K Lakshmi Cement, Sirohi, Rajasthan
7.	Establishing Limestone Consumption Factor M	M/s Heidelberg Cements, M.P.
8.	Establishing limestone consumption factor for	M/s Dhar Cement, M.P
9.	Evaluation of burnability of raw mix	M/s Prism Johnson Cement Ltd, Unit-I Satna, M.P
10.	Evaluation of burnability of raw mix	M/s Prism Johnson Cement Ltd, Unit-II Satna, M.P
11.	Establishing Limestone Consumption Factor	M/s NCL Industries Ltd, Simhapuri, Suryapet, Mattapally, Telangana
12.	Evaluation of burnability of raw mix	M/s Chettinad Cement Corporation, Dacheppalli Cement Works, Palandu, A.P.

Sl. No.	Name of Project	Sponsors
13.	Evaluation of burnability of raw mix samples.	M/s Chettinad Cement, Kallur, Kalaburgi, A.P.
14.	Evaluation of burnability of raw mix samples	M/s Dalmia Cement (Bharat) Ltd.
15.	Establishing Limestone Consumption Factor	M/s Cement Corporation of India (CCI), Vikarabad, (T.S)
16.	Establishing Limestone Consumption Factor	M/s Remco Cements Limited, Kolimigundla Mandal. Nandyal (Andhra Pradesh)
17.	Establishing Limestone Consumption Factor	M/s RCCPL,Chadrapur, M.H
18.	Establishing Limestone Consumption Factor	M/s Ultra Tech Cement Ltd., Vikram Cement Works, Neemuch, M.P.
19.	Development of standards for calibration of XRF for	M/s Maihar Cement Works, Sarla Nagar, Satna, M.P.
20.	Establishing Limestone Consumption Factor	M/s Remco Cements Limited, Kolimigundla Mandal. Nandyal (Andhra Pradesh)
21.	Optimization of Raw Mix Design based on the burnability study for Manufacture of OPC	M/s Dalmia Cement Ltd, New Delhi
22.	Feasibility studies for utilization of copper slag for manufacture of cement	M/s Adani Cement (Kutch Copper), Kutch
23.	Establishing Limestone Consumption Factor	M/s Prism Johnson Cement. Ltd., Unit-II, Satna, M.P.
24.	Establishing Limestone Consumption Factor	M/s Chanda Cement, Chandrapur, MH
25.	Establishing limestone Consumption Factor	M/s Heidelberg Cement Ltd., Narsindharh, Damoh, M.P
26.	Establishing Limestone Consumption Factor	M/s RCCPL,Chadrapur, M.H
27.	Evaluation of burnability of raw mix	M/s Birla White Ltd., Satna, M.P.
28.	Establishing limestone consumption factor for.	M/s J K Cement, Nimahera, Rajasthan

Sl. No.	Name of Project	Sponsors
29.	Establishing limestone consumption factor for	M/s UTCL, Sidhi Cement Ltd., M.P.
30.	Establishing Limestone Consumption Factor	M/s Cement Corporation of India (CCI), Vikarabad, (T.S)
31.	Evaluation of burnability of raw mix	M/s Birla Cop Ltd., Satna, M.P.
32.	Establishing Limestone Consumption	Factor M/s Zuari Cement Ltd., Yerrangundal, Kadapa Dist, A.P.
33.	Development of standards for calibration of XRF for	M/s ACC Ametha, M.P
34.	Evaluation of burnability of raw mix	M/s Birla Cop Ltd., Satna, M.P.
35.	Establishing limestone consumption factor for	M/s UTCL, (Bela Cement Works), Jaypee Puram, P.O Jaypee Puram, Rewa (M.P)
36.	Investigations on lump formation in cement bags for	M/s Haryana Cement Plant, Nuvoco Vistas Corp Ltd, Village, Charkhi Dadri, Haryana, 127022

Centre for Mining, Environment, Plant Engineering and Operation (CME)

Sl. No.	Name of Project	Sponsors
37.	Mandatory Energy Audit	M/s Saurashtra Cement Ltd, Veraval, Gujarat. (IU)
38.	Mandatory Energy Audit	M/s Saurashtra Cement Ltd, Sidheegram, Gujarat (IU)
39.	Mandatory Energy Audit	M/s UTCL- Aditya Cement Works, Rajasthan. (IU)
40.	Mandatory Energy Audit	M/s UTCL- Reddipalayam Cement, Tamil Nadu. Works (IU)
41.	Mandatory Energy Audit	M/s UTCL- Kotputli Cement Works, Rajasthan. (IU)
42.	Mandatory Energy Audit	M/s UTCL-Vikram Cement Works, Madhya Pradesh. (IU)

Sl. No.	Name of Project	Sponsors
43.	Mandatory Energy Audit	M/s UTCL-Rajashree Cement Works, Karnataka. (IU)
44.	Mandatory Energy Audit	M/s UTCL- Sarlanagar Cement Works, Karnataka. (IU)
45.	Mandatory Energy Audit	M/s UTCL- Narmada Cement Works, Gujarat. (IU)
46.	Mandatory Energy Audit	M/s UTCL- Roorkee Cement Works, Utara Khand (GU)
47.	Mandatory Energy Audit	M/s UTCL- Bathinda Cement Works, Punjab (GU)
48.	Mandatory Energy Audit	M/s UTCL-Bagheri Cement Works, Himachal Pradesh (GU)
49.	Mandatory Energy Audit	M/s UTCL- Patliputra Cement Works, Bihar (GU)
50.	Mandatory Energy Audit	M/s UTCL- Sonarbangla Cement Works, West Bengal (GU)
51.	Mandatory Energy Audit	M/s UTCL- Wanakbori Cement Works, Gujarat (GU)
52.	Mandatory Energy Audit	M/s ACC Ltd; Lakheri Cement Works, Rajasthan (IU)
53.	Heat balance & energy consumption optimization in cement kilns	Vassvadatta Cement, Sedam, Karnataka
54.	Process study for optimization of Raw Mills Line 1 & 2 at M/s KCP Cement Ltd	M/s KCP Cement Ltd
55.	Study of Heat and Gas/Air Balance and recommending corrective actions in pyro system	M/s CCI Tandur, Telangana
56.	Investigations on lump formation in cement bags at M/s Nuvoco Vistas Corp. Ltd., Haryana Cement Plant (HCP), Bhiwani, Haryana	M/s Nuvoco Vistas Corp. Ltd.: Haryana Cement Plant (HCP), Bhiwani, Haryana
57.	On-site measurements of Process Parameters across calciner & Preheater in a cement plant locating in Saudi Arabia	M/s Tridiagonal Solutions, Pune

Sl. No.	Name of Project	Sponsors
58.	On-site measurements of Process Parameters at Raw mill, Preheater and Bag filter ducts in a cement plant locating in Saudi Arabia	M/s Tridiagonal Solutions, Pune
59.	Performance Assessment of Existing APCE	Dalmia Cement (North East) Ltd.
60.	Central air conditioning and mechanical ventilation system at Balak ram hospital.	Municipal Corporation of Delhi
61.	Provision of construction of administration cum academic block at RBIPMT hospital in C-281/CLZ.	Municipal Corporation of Delhi
62.	S.I.T.C of Fan and Fittings during Construction of 200 bedded Balak Ram hospital ward block at Timar Pur, New Delhi.	Municipal Corporation of Delhi
63.	Provision of Sub-station, bus riser, LT panels, earthing, lighting conductor and external lighting etc. during construction of hostel block for boys and girls in medical college at Hindu Rao hospital in C-280/CLZ.	Municipal Corporation of Delhi
64.	Construction of permanent administrative block building at Rohini Depot-I. Sub Head: - Electrification and fire-fighting works of New Admin Building at DTC Rohini Depot-I	Delhi Transport Corporation
65.	Construction of permanent administrative block building at DTC Hasanpur depot.	Delhi Transport Corporation
66.	Renovation/up-gradation work of electrical installation of DTC Central workshop-II for creation of new DTC depot.	Delhi Transport Corporation
67.	Providing internal electrical installation during construction of 200 bedded Balak Ram hospital	Delhi Transport Corporation

Sl. No.	Name of Project	Sponsors
	ward block at Timar Pur, New Delhi.	
68.	Construction of 9 nos. class room, 2 nos. rooms, 1no. hall (equivalent to 02 rooms) and 8nos. toilet block on municipal corporation primary school at Vishnu Garden in Ward no. 007 in West Zone (Part B: Dismantling of existing old structure. Part C: P/o EI fans and compound lighting. Part D: Fire-fighting work and Part E: Grid tied rooftop Solar Power Plant)	CPWD

Centre for Construction Development and Research (CDR)

Sl. No.	SP No.	Title	Name of Sponsor
Concrete Technology (CON)			
69.	4805	Development and Evaluation of Properties of Geopolymer Concrete using GGBFS	JSW Cement Limited, JSW Centre, Bandra Kurla Complex, Bandra East, Mumbai
70.	6312	Evaluation of Activated GGBFS as an Alternative to Hydraulic Binder for Tata Steel Limited	Tata Steel Limited, R&D Main Building, Burma Mines Gate, Jamshedpur
71.	6481	Performance Evaluation of Bipolar Concrete Penetrating Corrosion Inhibitor CLEANFLO STEELCARE-2000 (CPCIA) to be used in Concrete	Cleanflo India Pvt. Ltd., Commercial Complex, Azadpur, Delhi
72.	6577	Concrete mix designs for concrete of grades M20, M25, M30, M35 and M50 (total 14 nos mix designs) with PPC & OPC-43 grade and two brands of admixtures along with evaluation of chemical admixture for 2X660MW, Talcher, NTPC TTPP Project	Bharat Heavy Electricals Limited, 2X660 MW TTPP, NTPC Talcher, Distt. Angul, Odisha
73.	6578	Evaluation for materials (cement samples, coarse aggregate sample and fine aggregate sample) for the work of	Bharat Heavy Electricals Limited, 2X660 MW

		"Construction of Talcher Thermal Power Project Stage-III (2X660MW)	TTPP, NTPC Talcher, Distt. Angul, Odisha
74.	6579	Performance Evaluation of E5® Internal Cure admixture in concrete	HROC (H.R. Organo Chem Pvt. Ltd, New Marine Lines, Mumbai
75.	6616	Evaluation of Concrete Making Materials and Concrete Mix Design for Concrete of Grade65A20 with OPC 53 Grade and Silica Fume for Parbati-III Power Station	NHPC Limited, Dam Complex-Civil, Parbati-III Power Station
76.	6632	Evaluation of concrete making materials and concrete mix design for concrete of grades M10, M15, M20, M25, M30, M35 & M40 with two different brands of cement for the work "Make-Up Water System and Ash Disposal Cum AWRS Package at Talcher Thermal Power Project Stage-II (2 x 660 MW)".	L&T Construction, Ganesh Vihar, Talcher, District-Angul, Odisha
77.	6641	Testing for Hydraulic Abrasion resistance as per ASTM C1138	Fosroc Chemicals India Pvt. Ltd. Taluk, Dobspet, Karnataka
78.	6644	Complete evaluation of aggregate, cement and water sample and mix design of dry lean cement concrete (DLC) for the work of "Construction of common central secretariat integrated buildings 1, 2, and 3 in plot No. 137, New Delhi	Central Public Work Department Central Vista Project Division-7, Vidyut Bhawan, New Delhi
79.	6645	Concrete mix design (2nos) for concrete of grade M35 with Ambuja PPC and Evaluation of concrete making materials (one cement sample and one chemical admixture sample) for the work of 2x660MW, Talcher, NTPC TTPP Project	Bharat Heavy Electricals Limited, 2x660MW TTPP, Talcher, Odisha
80.	6658	Evaluation of Concrete Making Materials and Concrete Mix Design for Concrete of Grades M25 & M30 for M/s GDCL	NTPC Limited , C/o Gannon Dunkerly Co. Ltd., Distt. Murshidabad, West Bengal
81.	6659	Long Term Performance Evaluation of Bipolar Corrosion Inhibiting Admixture in Concrete	CMRI Project Phase-II, Madhavaram, Chennai

82.	6668	Permeability Characteristics of "CORROSTOP-15" in Concrete	Laal Chemicals, 3/56, Mettur Main Road, Surapet, Chennai
83.	6682	Physical Testing, Petrography and AAR Testing of Coarse Aggregate and Fine Aggregate Samples of West Seti HE Project Nepal	P&C Division, West Seti & SR6 Project, Sudur Paschim Province, Nepal
84.	6696	Testing of Concrete Cubes Cast with and Without Integral Crystalline Admixture (Make Penetron and Kryton-KIM) for CPWD, IIT Project Division-I	Central Public Works Department IIT Project Division-I, CPWD, New Delhi
85.	6705	Testing of Aggregate Sample for BHEL Singrauli	BHEL, BHEL Site Office, 2x800MW, Singrauli Stage-III, Distt. Sonebhadra, UP
86.	6730	Evaluation of Petrographic and Mineralogical Analysis of One Coarse and One Fine Aggregate Sample and Mix Design of M50 Grade of Concrete (2 Nos) with Two Brands of Cement for TG Deck 2X660MW NTPC Talcher Thermal TPP Stage-III	Konark Enterprises, C/o BHEL, 2x660MW Talcher TPP), Bhubaneswar, Odisha
87.	6740	Testing of Roller Competed Concrete (RCC) Core Samples for Ratle HE Project (J&K)	Megha Engineering & Infrastructures Limited, C/o Western UP Power Transmission Co. Ltd., 400/220/33KV Substation, Kalapathar-Indirapuram, Ghaziabad
88.	6757	Evaluation of Concrete making materials and Mix Design of Pavement Quality Concrete (PQC) (M35 Grade) for the Work of Construction of Steam Generator & Associated Packages of 2X660MW Khurja Super Thermal Power Plant	THDC Khurja, KSTPP, Khurja Super Thermal Power Plant Project, Khurja, Bulandshahr
89.	6774	Evaluation of Aggregates for Potential Alkali Aggregate Reactivity and Petrographic Analysis of One Coarse Aggregate & One Fine Aggregate Sample for the work "Make-Up Water System and Ash Disposal Cum AWRS Package for NTPC Lara STPP-II (2X800MW)"	JWIL Infra Ltd., Jindal ITF Centre, 28, Shivaji Marg, Moti Nagar, New Delhi

90.	6806	Evaluation of materials and concrete mix design for PHB package for Singrauli Stage-III package awarded to M/s BHEL (Sub- agency M/s ECR Buildtech Pvt. Ltd.)	NTPC SSTPS, Shaktinagar, Sonebhadra
Structural Assessment and Rehabilitation (SAR)			
91.	5865	Condition Assessment Studies of TG foundations (3No's, 500MW each) at Rihand Super Thermal Power Station, Rihand Nagar, Uttar Pradesh	NTPC Ltd, Rihand Super Thermal Power Station, Rihand Nagar, Dist.: Sonebhadra, Uttar Pradesh
92.	6054	Detailed Condition Assessment Study of Concrete Structures of NTPC TSTPS, Kaniha	NTPC, Kaniha, PO: Deepshikha, Dist.: Angul, Odisha
93.	6103	Carryout Structural Audit of Buildings in Delhi Ref: (i) Community Centre at Tamoor Nagar ward No.101-S (Sarita Vihar) (ii) M.C Pry. School Malarbrand Ward No.96-S New Block)	Executive Engineer M-IV/Central Zone, South Delhi Municipal Corporation, Delhi
94.	6280	Preliminary site Inspection to define scope of work for assessment and preparation of detailed proposal regarding assessment and testing of structures (i.e. Residential Quarters, Transit Camp, Recreation Centre, etc.).	Power Grid Corporation India Limited, Northern Region-I, Regional Head Quarter, Faridabad
95.	6325	Condition Assessment and Recommendations on Repair & Restoration / Strengthening measures of RCC Structures at NTPC Tanda	Tanda Super Thermal Power Station, NTPC Limited, Tanda PO: Vidyutthnagar, Dist. Ambedkar Nagar, Uttar Pradesh
96.	6333	Condition assessment and recommendations on Repair & Restoration Measures of SMPK Guest House & first floor at Fairlie Warehouse, SMPT, Kolkata	Civil Engineering Department, Syama Prasad Mookerjee Port Trust, Kolkata
97.	6454	Condition Assessment Using Non-Destructive Evaluation Technique for Repair & Rehabilitation of Civil Structures of Patancheru Campus for NMDC R&D Center at Hyderabad, Telangana.	NMDC Limited Head Office, Khanij Bhavan, Masab Tank Hyderabad

98.	6587	Carrying out Random Quality Inspection during Repair and Strengthening of RCC Chimney at PP-II, NSPCL, Bhilai	NTPC SAIL Power Company Limited (NSPCL), Bhilai PP-II, Dist: Durg, Bhilai, Chhattisgarh
99.	6591	Carrying out Condition Assessment of Civil Foundation of Stacker Reclaimer # 2 at CHP, NTPC Kudgi	Kudgi Super Thermal Power Station, NTPC Limited, Kudgi
100.	6593	Preliminary Site Inspection for Condition Assessment of PSC RCC Box Bridges of MGR System at NTPC Kahalgaon	Kahalgaon Super Thermal Power Project, P.O. Kahalgaon STP Kahalgaon, Dist. Bhagalpur, Bihar
101.	6600	Condition Assessment of Kendriya Vidyalaya School building at Sector-2, R K Puram, New Delhi	'S' Division, CPWD, East Block-2, Level-2, R.K. Puram, New Delhi
102.	6620	Preliminary Inspection of various RCC structures in plant area at Farakka Super Thermal Power Station NTPC Ltd., West Bengal	NTPC Limited, Farakka Super Thermal Power Station, PO-Nanarun. Dist. Murshidabad, West Bengal
103.	6627	Condition Assessment of (i) Lady Harding Medical College Hospital Staff Quarters and (ii) Kalawati Saran Children Hospital (Old Block) at Panchakuian Road, New Delhi	Assistant Engineer-III, 'SSK' Division, CPWD, SSK, New Delhi
104.	6630	Condition Assessment of the building at ICAR, Krishi Vihar, New Delhi	V-Division, CPWD, East Block-3, Level-5, R.K. Puram, New Delhi
105.	6643	Carry out Structural Stability using Non Destructive Evaluation Technique for Stability and Visual Conditional Evaluation for Minor Bridge at Shelti Goratpada on Khanvel Dudhani Main Road in District of UT of Dadra& Nagar Haveli	Public Works Department (R & B Division) Silvasa - Dadra & Nagar Haveli and Daman & Diu
106.	6650	Preliminary site Inspection for Condition Assessment of RCC Civil Structures at RGPPL	NTPC Limited, Ratnagiri Gas & Power Private Limited, Taluka Guhagar Ratnagiri, Maharashtra
107.	6669	Condition Assessment of CGST Tax Pool Qtrs. 78 Nos. at DDA Flats, Kalkaji, New Delhi.	V-Division, CPWD,Level-5, R.K. Puram, New Delhi

108.	6670	Condition Assessment studies of RCC IDCT Structures-4 No's at STPP	The Singareni Collieries Company Limited, 2*600 MW Singareni Thermal Power Plant, Jaipur (V&M), Mancherial District, Telangana State
109.	6690	Preliminary Site Inspection for condition assessment of RCC Civil structures Culverts and Bridges of FSTPS MGR System at NTPC Farakka	NTPC Limited, Farakka Super Thermal Power Station, PO-Nanarun. Dist. Murshidabad, West Bengal
110.	6691	Preliminary Inspection for the Condition Assessment of various plant structures of Stage-I & Stage-II at NTPC Mouda, Nagpur	NTPC Limited, Mouda STPS Mouda-Ramtek Road, Nagpur
111.	6693	Preliminary Site for Condition assessment of RCC Structures of Unit #1, Unit#2, Unit#3, Unit#4, Unit#5 & Unit#6 at NTPC Dadri	NTPC Limited, NCPS Dadri, Distt. Gautam Budh Nagar, Uttar Pradesh
112.	6694	Preliminary Site Inspection of Various lot of Machine/equipment foundation like mill foundations (55 no's), PA Fan (14 no's), FD fan (14 no's), ID Fan (17 no's) BFP, TDBFP & MDBFP (14 no's) etc. at NTPC Korba	NTPC Limited, Korba Super Thermal Power Station, P.O. Vikas Bhawan Jamnipali, Dist. Korba, Chhattisgarh
113.	6697	Condition assessment of Income Tax Pool Qtrs. 100 nos. at DDA Flats, Kalkaji, New Delhi	V-Division, CPWD, Level-5, R.K. Puram, New Delhi
114.	6698	Condition Assessment of HUDCO Flats at AGV, New Delhi	V-Division, CPWD, Level-5, R.K. Puram, New Delhi
115.	6700	Preliminary Site Inspection for Condition Assessment of mill foundation at NTPC-Barauni TPS	NTPC Limited, Barauni Thermal Power Station, Begusarai, Bihar
116.	6702	Condition Assessment of Academic Block/College Building at Kirori Mal College, University of Delhi	Kirori Mal College, University of Delhi, Delh
117.	6706	Condition assessment studies of underground galleries in CHP area at NTPC Tanda	Tanda Super Thermal Power Station, NTPC Limited, Tanda, Dist.: Ambedkarnagar

118.	6714	Distress Condition Assessment Studies and Assessment for Extension of Administrative Building at PP-II	PP-II, NTPC SAIL Power company (P) Ltd, (NSPCL), Durgapur – 713203, West Bengal
119.	6716	Preliminary Site Inspection of NTPC Nabinagar/NSTPS/Vibration issues in makeup water pump house at NTPC Nabinagar	NTPC Ltd., NSTPS, Shivanpur, P.O. Aditi Nagar, Aurangabad
120.	6729	Preliminary Site Inspection for Condition Assessment of RCC Structures of Anta Gas Power Station Rajasthan	NTPC Limited, Anta Gas Power Station, Dist-Baran, Rajasthan
121.	6731	Carrying out concrete Core Extraction and Testing at 765/400 kV Narela GIS Substation at Village Mungeshpur, Delhi	Power Grid Corporation of India Ltd. (PGCIL), Village Mungeshpur, Delhi
122.	6748	Condition Assessment of Residential Quarters of Type-B (17no.), Type-C (5no.), Type-D (1nos), Recreation Center (1nos) & Transit Camp (1nos) at PGCIL 400/220kv Bassi Substation Damodarpura, Bassi, Distt-Jaipur	Power Grid Corporation India Limited. 400/220 KV Sub Station Bassi Sub Station, Damodarpura, Bassi, Jaipur, Rajasthan
123.	6751	Condition assessment of Residential Quarters of Type-B (14 nos.), Type-C (4 nos.), Type-D (1 no), Transit Camp and Recreation Centre at PGCIL 400/220kv Ballabgarh Substation, Near Samaypur, Faridabad	Power Grid Corporation India Limited, 400/220 KV Sub Station, Samaipur, Ballabgarh, Faridabad
124.	6755	Condition Assessment of Regional AGMARK Laboratory (RAL), Okhla, New Delhi	CPWD, R.K. Puram, New Delhi
125.	6760	Condition Assessment of type-III building at Minto Road Complex, New Delhi	CPWD, L-Mandal, Indraprastha Bhawan, New Delhi
126.	6761	Structural health assessment (Crack Depth measurement) Study of U-7 TG Deck at Korba Super Thermal Power Station NTPC Ltd., Chhattisgarh	NTPC Limited, Korba Super Thermal Power Station, Dist. Korba, Chhattisgarh
127.	6762	Carrying out Core Test and UPV Test of M35 grade concrete of RCC Chimney (Unit 7) Shell at Stage-II, 3X500 MW NTPC Kahalgaon Super Thermal Power Station	Bharat Heavy Electricals Limited, FGD Stage-I & II Package, BHEL PSER Kahalgaon site, Bhagalpur, Bihar

128.	6781	Carrying out Ultrasonic Pulse Velocity (UPV) Testing of Various structures of Unit#2 & Unit#3 of 3x660 MW North Karanpura STPP, Jharkhand as per IS 516 (Part-5/Sec-1:2018)	NTPC Limited, 3x660 MW, NTPC North Karanpura STPP, Tandwa, Chatra, Jharkhand
129.	6787	Carrying out Concrete Core Extraction and Testing at Fatehgarh-III Substation construction project Powergrid Ramgarh Transmission Limited at Teh. - Fatehgarh, Jaisalmer, Rajasthan	Powergrid Ramgarh Transmission Limited (PRTL), 765/400/220KV, Fatehgarh-II Substation, Devikot - Jaisalmer, Rajasthan
130.	6798	Preliminary Site Inspection for carrying out Distress Assessment by Non-Destructive Tests (NDT) of fire affected concrete in Spillway Block S5 at Subansiri Lower HE Project (2000 MW)	NHPC Ltd. Subansiri Lower H.E. Project, Gerukamukh, Distt. Dhemaji, Assam
131.	6800	Preliminary site Inspection for Condition Assessment of RCC structures at Dada Laxmi Chand state University of Performing & Visual Arts (DLCSUPVA) Rohtak, Haryana	RITES Ltd., Building Unit (Gurgaon)
Construction Technology and Management (CTM)			
132.	5502	Construction of Administrative Building, Boys & Girls Hostel for SGSU at Desar	Swarnim Gujarat Sports University, Gujarat
133.	5517	Third Party Quality Assurance Consultancy for Construction of 1568 DU's/600 Cat-II (312 DU's 2 BHK + 288 DU's 1 BHK) and 968 EWS Multistoried Composite Houses including Internal Development and Electrification in Pocket-5, Sector-14, Dwarka Phase-II	Delhi Development Authority, Western Division-13, Kirtinagar, New Delhi
134.	5584	Construction of Campus Development of Sports Complex at Nadiad & Construction of Synthetic Athletic Track at Naroda	Sports Authority of Gujarat (SAG), Gandhinagar, Gujarat
135.	5834	I) Payment will be made monthly on raising the bill within 30 days after the receipt of bill by the client. II) Final payment will be made after the submission of final Report and approval	Swarnim Gujarat Sports University (SGSU)

		by Swarnim Gujarat Sports University (SGSU)	
136.	6031	1. Providing Construction of Work Sports Climbing D Wall at Naroda, Ahmedabad. 2. Construction of work Hostel at Gandhinagar.	Sports Authority of Gujarat (SAG)
137.	6163	Third Party Quality Assurance for Various works of Construction of Type-V, 24 Nos Quarters at IARI Pusa, New Delhi	Construction Division-IV, Central Public Works Department, IARI, Pusa, New Delhi
138.	6235	Construction of Site Development & Miscellaneous Practice Ground at Swarnim Gujarat Sports University at Desar	Swarnim Gujarat Sports University (SGSU)
139.	6236	Construction of University officer's and Staff Quarters at Swarnim Gujarat Sports University at Desar	Swarnim Gujarat Sports University (SGSU)
140.	6249	Third Party Inspection and Monitoring (TPIM) for Construction of Fly Over Bridges at two major junctions of Ring road stretches forming at Dokmardi (Point F) on Silvassa Kilvani Road and at point C crossing Silvassa Sayli Road in UT of Dadra & Nagar Haveli	Public Works Department, (R & B Divison) Silvasa-Dadra & Nagar Haveli and Daman, & Diu
141.	6298	Third Party Inspection (TPI) consultancy for Quality Assurance and Inspection of Materials for Construction of work Gujarat Akademi Bhavan Gandhinagar(SAG)	Sports Authority of Gujarat (SAG), Gandhinagar, Gujarat
142.	6351	Third Party Quality Assurance/Audit for the Work "Construction of 572 seater Student EWS Hostel (Phase-I) including Internal E1, HVAC, Firefighting, Electrical Substation, DG Set, Lift Installations & Development works on EPC Basis at Vigyan Kunj, IIT Roorkee, Roorkee, Uttrakhand (SH: Third Party Quality Assurance and Audit (TPQA) Work – Recall)	Government of India, IIT Project Roorkee, CPWD, 11, Niti Nagar, IIT Roorkee
143.	6590	Third Party Inspection and Monitoring (TPIM) for Construction of High Level	Public Works Department, (R & B Divison) Silvasa-

		Bridge across river Damanganga at Athal on Silvassa Naroli Road (EPC Mode) in the District of UT of Dadra & Nagar Haveli (D&NH), Silvassa	Dadra & Nagar Haveli and Daman, & Diu

Appendix – IV

Research and Development

Programme 2024–2025: In Progress

Sl.	Project No.	Project Title	Date of commencement
PROJECTS UNDER DCCI			
1	ESC-01	Development of Net Zero Roadmap for Indian Cement & Concrete Sector	Apr 2024 - Mar 2025
2	COB-15	Novel method for estimation of glass content in use of non-ferrous slags in cement manufacture	Apr 2024 - Mar 2026
3	COB-16	Investigations on use of Low Lime industrial wastes for Carbon Capture and Utilization	Apr 2024 - Mar 2027
4	COB-17	Development of foam aggregate using bottom ash (pond ash) and other industrial waste; No Progress in project	Apr 2024 - Mar 2027
5	WAU-23	Investigations on utilization of fly ash, generated by co-firing of biomass, in cement manufacturing	Apr 2024 - Mar 2026
6	PSD-03	Development of Pre-combustion technology for AF burning and increasing TSR in Indian Cement Plants	Apr 2024 – Sep 2025
7	AFT-02	Electrification of the cement calciner for carbon capture in cement industry	Apr 2024 - Mar 2027
8	AFT-03	Development of CO_2 emission factors and Biogenic Index of alternative fuels used in Indian Cement Industry	Apr 2024 - Mar 2026
PROJECTS UNDER: PROJECT BASED SUPPORT FOR AUTONOMOUS INSTITUTES			
1	CON-20	Mechanical and Durability Performance of CO_2 sequestered sintered ash lightweight aggregate in concrete	Apr 2024 - Mar 2027

Appendix – V

NCB Patents Granted/ Filed During 2011-2024

Patents Granted:

Sl. No.	Patent No	Title	Names of Inventors
1.	344069	Mineralizing effect of "barium sludge- an industrial byproduct" in the manufacture of ordinary Portland cement	Sh. A Pahuja Dr. M M Ali Dr. V P Chatterjee Sh. S K Chaturvedi Sh. S K Agarwal
2.	314591	Rationalizing formulations and curing conditions for improving properties of hardened Geopolymeric Cement	Sh. Ashwani Pahuja Dr. M M Ali Dr. R S Gupta Dr. S Vanguri Dr. V Liju
3.	337143	Process for the Preparation of sulphoaluminate - belite cement utilizing high magnesia / dolomitic limestone	Sh. Ashwani Pahuja Dr. M M Ali Sh. P S Sharma Dr. V P Chatterjee
4.	340210	Nanosilica blended ordinary Portland cement compositions with improved performance characteristics and a process thereof	Sh. Ashwani Pahuja Dr. M M Ali Dr. S Harsh Sh. Suresh Vanguri Dr. Varsha Liju
5.	344307	Fast process for determining expected 28-days compressive strength of concrete made with Portland Pozzolana Cement (PPC)	Sh. V V Arora Sh. Suresh Kumar Sh. Manish Kumar Mandre
6.	294833	A process for producing of Ordinary Portland Cement	Sh M Vasudeva Dr M M Ali Dr D Yadav

Sl. No.	Patent No	Title	Names of Inventors
			Dr J M Shatma NALCO Officials
7.	295058	A process for preparation of synthetic slag from low grade limestone and dolomite	Sh. A Pahuja Dr. M M Ali Sh. P S Sharma Sh. S K Chaturvedi Sh. S K Agarwal Dr. V P Chatterjee Dr. D. Yadav Sh. Tashi Tshering Sh. Udai Kaflay
8.	347356	Marble dust as mineral additive in the manufacture of ordinary Portland cement	Sh. A Pahuja Dr. M M Ali Sh. P S Sarma Sh. S K Agarwal Sh. Ashish Goyal
9.	355368	Method for rapid estimation of Na_2O and K_2O in different types of cement and raw materials	Sh. Ashwani Pahuja Dr M M Ali Sh. S K Chaturvedi Sh. S. C. Sharma
10.	444190	Ordinary Portland cement clinker utilizing limestone mine rejects	Sh Ashwani Pahuja Dr M M Ali Dr V P Chatterjee Sh S K Chaturvedi Sh S K Agarwal
11.	456816	A Process for Preparing Tiles	Sh Ashwani Pahuja Dr. S K Chaturvedi Dr S Harsh Dr. R S Gupta Sh. S Vanguri Dr. V Liju Dr. M N K Prasad
12.	533094	Geoploymer concrete paving block and a process for preparation thereof	Sh. V.V. Arora Sh. Amit Trivedi Sh. Lalit Kumar

Sl. No.	Patent No	Title	Names of Inventors
13.	437424	Aqueous dispersion of CNT using chemical admixture and its application in cementitious materials	Dr S K Chaturvedi Dr A K Dikshit Dr S Palla Dr Satya Pal Singh Dr Sova Bhattacharya Dr Gurpreet Singh Kapur Sh Madhusudan Sau Sh Naduhatty Selai Raman ShChandrasekaran Kannan Sh S S V Ramakumar
14.	516001	Sustainable concrete composition and method for preparation thereof	Ms Sonal Saluja Dr Arun Gaur Dr Sanjay Mundra

Patents Filed:

SI. No.	Application No.	Title	Name of Inventors
1.	201911049295	Composition of PPC and PSC using High Magnesia (MgO) clinker	Dr B N Mohapatra Dr S K Chaturvedi Sh G J Naidu Sh Giasuddin Ahamed
2.	202311023188	A flexible Material Transfer Apparatus for Handling Solid Alternative Fuels & their mix	Sh Kapil Kukreja Dr Manoj Kumar Soni Dr B N Mohapatra
3.	202311059563	Vertical Alternative Fuel Dyer (VAFD) for minimizing moisture content of solid alternative fuels (AFs)	Dr L P Singh Dr D K Panda Dr Kapil Kukreja Mr Prateek Sharma Mr Ankur Mittal Mr Bharat Bhushan

SI. No.	Application No.	Title	Name of Inventors
4.	202411051834 (Provisional)	A system and a method for carbon dioxide capture in oxygen based calciner	Rayees Ahamed Anand Bohra S K Shaw V Nagakumar K P K Reddy Giasuddin Ahamed D K Panda L P Singh S K Chaturvedi Tushar Goel Sameer Bharadwaj
5.	202511028484 (Provisional)	An electrified spiral down tube calciner system	Dr L P Singh Dr D K Panda Dr Kapil Kukreja Mr Prateek Sharma Mr Anand Bohra Mr K P K Reddy Mr Ashish Gautam

National Council for Cement and Building Materials
(under the administrative control of DPIIT, Ministry of Commerce and Industry, Govt. of India)
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