Centre for Construction Development and Research

NATIONAL COUNCIL FOR CEMENT AND BUILDING MATERIALS

Under the Administrative Control of Ministry of Commerce & Industry, Government of India



About the Council

National Council for Cement and Building Materials (NCB), set up in 1962, then known as Cement Research Institute of India, is the apex body in India under the administrative control of Department of Industrial Policy and Promotion, Ministry of Commerce and Industry, Government of India, devoted to research, technology development and transfer, education and industrial services for cement, building materials and construction industries. Its multi-disciplinary activities are performed in an integrated and coordinated manner through its units that are located at Ballabgarh (Near Delhi) and Hyderabad. The six corporate centres of the council guide the activities at different units. The centre and their main areas of activity are :

Centre for Construction Development & Research (NCB-CDR) – Concrete Technology, Structural Assessment and Rehabilitation, Structural Optimization & Design and Construction Technology and Management.

Centre for Cement Research & Independent Testing (NCB-CRT) – Fundamental and Basic Research, Cement and other Binders, Waste Utilization, Refractories & Ceramics and Testing Services.

Centre for Mining, Environment, Plant Engineering & Operation (NCB-CME) – Geology, Mining & Raw Materials, Process Optimization & Productivity Enhancement, Energy Management, Plant Maintenance, Project Engineering & System Design, Environmental Management.

Centre for Industrial Information Services (NCB-CIS) – Industrial Information and Data Bank, Integrated IT Solutions, Publication, Seminars & Conferences, International & National Linkages, Image Building.

Centre for Continuing Education Services (NCB-CCE) – Long-Term & Short-Term Courses, Special Group Training Programmes, Simulator Based Courses, Workers Development Programmes.

Centre for Quality Management, Standards & Calibration Services (NCB-CQC) – Total Quality Management, Calibration Services, Development and Supply of Certified Reference Materials.

Centre for Construction Development and Research (CDR)

Centre for Construction Development & Research (CDR) is at the fore front in the service of concrete and construction industry. Strategic Goal of the CDR is to contribute in developing durable and sustainable civil infrastructure for the nation. CDR anticipates and meets the critical requirements and technology needs and solve contemporary and emerging engineering problems of the concrete and construction industries through state-of-the-art interdisciplinary research and consultancy services.

Area of Research & Services Offered

Concrete Technology

Structural Assessment and Rehabilitation

Structural Optimization & Design

Construction Technology and Management

Concrete Technology

Services Offered :

Evaluation of Concrete Making Materials :

- Cement and cementitious Materials such as OPC, PPC, PSC, Fly ash, Slag, Silica-fume etc.
- Aggregates – Complete physical and chemical analysis, Petrography, Soundness and Alkali-aggregate reactivity
- Chemical Admixture : Effectiveness and compatibility studies of Super-plasticizers, accelerators, VMA, Anti washout admixture, Corrosion inhibitors, Anti shrinkage compounds, water proofing chemicals etc.
- Mixing and curing water & Curing compounds

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.
- Development of Special Concrete such as High Performance Concrete, Pervious concrete, Plastic concrete High Volume Fly ash Concrete, Self-Compacting Concrete, Pavement Quality Concrete, Dry Lean Concrete, Roller Compacted Concrete, Under water concrete, Fiber Reinforced Concrete, Controlled Low Strength Material (CLSM) etc.
- Shotcrete & Non Shrink Grout

Durability Studies of Concrete Through Accelerated Test :

- Carbonation induced reinforcement corrosion
- Chloride induced reinforcement corrosion
- Performance of concrete against Sulphate attack
- Alkali–Aggregate Reaction and other aggressive environment to cause deterioration of concrete

Studies Undertaken :

- Evaluation of concrete making materials like cement, water, mineral/ chemical admixtures & aggregates for alkali-aggregate reactivity and other properties for hydroelectric & thermal power plants (more than 50 projects per annum).
- Concrete mix proportions for various grades of concrete for different projects across the country (more than 250 mix designs per annum).
- Use of flyash, bottom ash and recycled aggregate in concrete
- Development of Accelerated Mix Design Method for Concrete using PPC & OPC with Flyash.
- Creep testing and coefficient of thermal expansion of concrete.
- Evaluation of Low Density Aggregates (LDA) and Structural Lightweight Concrete using LDA.
- Study on the use of copper slag as a replacement to river sand in different grades of concrete
- Study of availability (quantity) and quality of construction materials for NTPC Project at Pudimadaka, Andhra Pradesh.
- Development of high abrasive strength materials for spillway and glacis

Workability Measurement of Roller Compacted Concrete

V-Funnel & L-Box Test for SCC

Abrasion Resistance Test for Concrete

Confined & Unconfined Compressive Strength Determination for Plastic Concrete

Abrasion Value Test for Aggregate

Structural Assessment and Rehabilitation

UPV Test of Concrete Structure for Quality Assessment

Services Offered :

- In-situ quality assessment, durability investigation and residual life assessment of concrete structures
- NDT, Pile integrity testing and Impact echo testing
- 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
- Study of Micro-structure of Concrete using SEM, OM, XRD, TG-DTA-DSC
- Bridge diagnostic testing using state-of-the-art equipment

Pile Integrity Test of Prestressed Concrete Bridge

Studies Undertaken

- In-situ testing of concrete structures for assessment of quality and distress evaluation of concrete structures of various types across the country (more than 35 projects per annum)
- Condition assessment of civil structures including field and laboratory studies using state-of-the-art equipments covering recommendations for repair and remedial for restoration and rehabilitation of the aging structures to ensure the structural integrity, restoration of strength and health of RCC structures like Turbine Generator Foundation, Boiler Mill Foundation, FD & ID Foundations, Chimney Shell, Silos etc
- Study on field and laboratory investigations of concrete dam
- Study for installation of suitable Monitoring/Inspection equipment inside lined water tunnels to monitor long term performance of lining without dewatering for upcoming hydro power projects
- Assessment study of 32 years old Cast in-situ RCC conduit (2800mm internal diameter) carrying discharge of 200 Cusec of Ganga Water from Muradnagar to Gokulpuri, Delhi (Total 26 Km Stretch) and recommendation for restoration & strengthening for Delhi Water Supply Maintenance Unit
- Performance evaluation for Steel Fibre Reinforced Shotcrete (SFRS) Lining of the underground Desilting Chambers of a hydro power project
- Assessment of fire damaged Reinforced Concrete Structures

Structural Assessment of under Construction Chimney

Core Extraction from Fire Damaged Structure

Half-cell Potential Measurement of Corrosion Damaged Structure

Crack width Measurement from Extracted Core

Structural Optimization and Design

Services Offered :

- Evaluation of Structural adequacy and Seismic load carrying capacity of structures
- Proof Checking of Structural Design
- Service Life Design for concrete structures
- Load testing and assessment of load-carrying capacity of structural elements

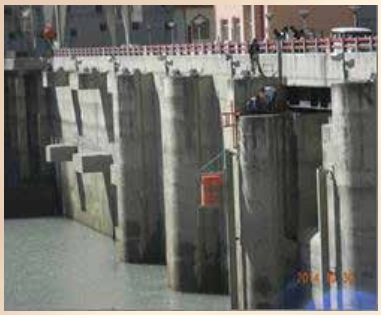
Load Test on Pretension Girder for Flyover Project

Studies Undertaken

- Performance and durability studies on Prestressed Concrete made with PPC
- Development of Methods for Service Life Design for Concrete Structure
- Development of Design Parameters for High Strength Concrete
- Effect of higher SO_3 content in cement on durability of concrete
- Performance evaluation of M40, M60 & M80 grade fibre reinforced concrete for performance improvement of concrete structures
- Load testing of Prestressed I-girder for Yamuna expressway Project

Measurement of Elongation in HT strands in Pre-stressed Box Girder of Flyover

Test for Determination of Creep Coefficient (In Compression)



Field Investigation for Residual Life Assessment of Dam Structure

Accelerated Carbonation and Chloride Induced Corrosion Studies

Long Term Durability Studies on Pre-stressed Concrete Beams

Long Term Creep Testing on Pre-stressed Concrete Beams (In Flexure)

Flexure Toughness Test on Steel Fibre Reinforced Concrete

Construction Technology and Management

Witness of load applied during post-tensioning of Bridge Deck

Services Offered :

- Quality control services to construction project through mobile laboratories
- 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.
- Consultancy for flyash based building products such as flyash bricks, paver blocks, kerb stones, aerated concrete block etc
- Precast Concrete Technology

Inspection of Concreting work at Flyover Site

Studies Undertaken

- Third Party Quality Audit & Assurance for more than 1000 construction projects such as Buildings, Roads, Underpasses, Over Bridges, Drains, Stadiums etc of Municipal Corporations of Delhi and Delhi Urban Shelter Improvement Board
- Third Party Audit & Quality Assurance for Flyovers, Elevated Corridors, Grade Separators, Bridges and other allied works for Public Works Department, Delhi
- Technical Audit and Quality Assurance including testing of materials, repairs, retrofitting, capability building etc for major reconstruction projects of earthquake affected areas for Gujarat State Disaster Management Authority (GSDMA)

View of Completed Flyover projects under Third Party Quality Assurance & Audit carried out by NCB

Nangloi Flyover, Delhi

Bhera Enclave Under Pass, Delhi

Raja Ram Kohli Flyover, Delhi

Neela Huaz Bridge over Pond, Delhi

Ring Road Rajghat Flyover, Delhi

Anand Vihar Grade Separator, Delhi

State-of-the-art Laboratory Facilities

NABL Accredited Advance Concrete Composite Laboratory with state-of-the-art equipments for concrete mix proportioning & advance studies of fresh and hardened concrete properties.

MOE and Poisson's ratio as per IS: 516 and ASTM C-456

5000 KN UTM Machine for testing of Reinforcing Steel

Fatigue Testing on concrete for one Million Cycles

Under Water Abrasion Testing as per ASTM C1138

Concrete Durability Studies Laboratory with state-of-the-art facilities of accelerated tests for Carbonation & Chloride induced corrosion, Sulphate attack, Alkali-Aggregate Reactivity and other deterioration process of concrete.

Water Permeability Testing as per DIN 1048 Part-5

Accelerated Carbonation Studies as per ISO 1920:Part-12

Air permeability Test Kit

Rapid Chloride Permeability Test as Per ASTM C1202

Non-destructive Testing and Distress Investigation Laboratory with state-of-the-art equipment such as Digital Rebound Hammer, UPV tester, Corrosion Analyzer, Endoscopy, Pile Integrity Tester, Ground Penetrating Radar, Impact Echo Tester etc.

Half Cell Potential Measurement Kit

PUNDIT Lab Plus (UPV Tester) for Quality Assessment

Extraction of Concrete Core of 150 mm diameter on Upstream and Gallery Portion of Dam structure

SOME OF OUR VALUED CUSTOMERS

- ACC Limited, Mumbai
- Agricultural Produce Marketing Committee, Gujarat
- Airport Authority of India
- All India Institute of Medical Sciences, New Delhi
- Bharat Heavy Electricals Limited
- Bina Power Supply Company Limited
- Central Public Works Department
- Central Water Commission
- Damodar Valley Corporation, Kolkata
- Delhi Development Authority
- Delhi Metro Corporation Limited
- Delhi Tourism & Transport Development Corporation Limited
- Delhi Urban Shelter Improvement Board
- EDCIL (India) Limited
- GAIL (India) Limited
- Gannon Dunkerley and Company Limited
- Garrison Engineer (AF) Zone, Air Force, Pathankot
- Gujarat Maritime Board
- Gujarat State Disaster Management Authority, Ahmedabad
- Haryana Urban Development Authority
- Indian Agricultural Statistical Research Institute, New Delhi
- Indian Institute of Public Administration, New Delhi
- Indian Oil Corporation Limited
- Ira-Infra Engineering Limited
- Jindal Power Limited, Chattisgarh
- Larsen & Toubro Limited
- Mangdechhu Hydroelectric Project Authority, Bhutan
- Municipal Corporations of Delhi
- National Highways Authority of India
- NHPC Limited
- National Informatics Centre, Hyderabad
- National Small Scale Industries Corporation, New Delhi
- NTPC Limited.
- NBCC Limited
- NMDC Limited
- NMDC Limited, Hyderabad
- Omnibus Industrial Development Corporation, Daman
- Penden Cement Authority Ltd, Gomtu, Bhutan
- Public Works Department, Govt. of Delhi
- Public Works Department, Govt. of Meghalaya
- Ratnagiri Gas & Power Company Limited
- Reliance Energy Limited
- Reliance Infrastructure Limited
- Reserve Bank of India
- RITES Limited
- Sardar Sarovar Narmada Nigam Ltd, Gujarat
- Shapoorji Pallonji Srilanka Pvt Ltd, Srilanka
- Simplex Infrastructure Pvt. Ltd.
- SINTEF Building and Infrastructure, Norway
- Sutlaj Jal Vidyut Nigam Limited
- Talwandi Sabo Power Limited
- TATA Power Delhi Distribution Ltd
- UP Rajya Vidyut Utpatan Nigam Ltd
- Uttar Pradesh Jal Nigam Limited

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