Request for Proposal

For

Design, Engineering, Procurement and Execution of Waterproofing and related Structural Repair works of Basement floors in NABARD Head Office Building at BKC, Bandra East, Mumbai - 51

IMPORTANT DATES	
Date of Issue of Tender	11.03.2025
Date of Pre-Bid Meeting	18.03.2025 @ 11:00 Hrs
Bid-Submission Start Date	21.03.2025 @ 11:00 Hrs
Bid-Submission End Date	08.04.2024 @ 14:00 Hrs
Date of Opening of Technical Bids	08.04.2024 @ 15:00 Hrs
Date of Technical Presentation	Will be communicated later
Date of Opening of Financial Bid	Will be communicated later

Issued by

Department of Premises, Security and Procurement

Nation al Bank for Agriculture and Rural Development (NABARD)

Head Office

Mumbai

Part I – Technical Bid		
Contents		**Page**

Definitions

S. No	Abbreviation	Description
1	Applicant/ Contractor/ agency/ vendor/ bidder	An entity (Agency / Firm / Company) having the required experience and obtained / downloaded the bid document from NABARD website/ CPP portal and also submitted the proposal.
2	Tender/ Bid document	Shall also mean this RFP document
3	Application/ Bid	The bid submitted by the applicant in the prescribed format.
4	Project	Design, Engineering, Procurement and Execution of Waterproofing and Related Structural Repair works of Basement Floors in NABARD Head Office Building at BKC, Bandra East, Mumbai - 51
5	NABARD/ Bank/ Bank's Engineer/ NABARD's Officials	Bank's Employee/ Authorized person by the bank acting on behalf of Department of Premises, Security and Procurement (DPSP), National Bank for Agriculture and Rural Development, Head Office, Mumbai
6	Site of Work	National Bank for Agriculture and Rural Development, Head Office, Plot C-24, G Block, Bandra Kurla Complex (BKC), Bandra East, Mumbai – 400 051
7	Similar Work	Execution of extensive and comprehensive or specialized waterproofing and structural repair works of underground/ basement RCC structure of civil infrastructure for rehabilitating the existing structure in Government / Semi-Government / Public Sector Undertakings / Multinational Organizations/ Banks/ Corporate Offices/ Financial Institutions.

Disclaimer and Confidentiality

1. The information contained in this bid document or information provided subsequently to intending applicants whether in documentary form/email on behalf of the Bank, is subject to the terms and conditions set out in this bid document.

2. This bid is not an offer by the Bank, but an invitation to receive responses from the eligible bidders. No contractual obligation whatsoever shall arise from the RFP process unless and until a formal contract/agreement is signed and executed by the Bank with the selected bidder.

3. This RFP is provided for information purposes only and upon the understanding that such parties will use it only for the purpose set forth above. It does not purport to be all-inclusive or contain all the information about the Project in relation to which it is being issued.

4. The purpose of this bid document is to provide eligible bidders with information to assist preparation of their proposal. This bid does not claim to contain all the information each bidder may require. Each bidder should conduct its own investigations and analysis and should check the accuracy, reliability and completeness of the information contained in this bid document and wherever necessary obtain independent advice/clarifications. The Bank may, in its absolute discretion, but without being under any obligation to do so, update, amend or supplement the information in this document.

5. The Bank, its employees and advisors make no representation or warranty and shall have no liability to any person under any law, statute, rules or regulations or tort, principles of restitution or unjust enrichment or otherwise for any loss, damages, cost or expense which may arise from or be incurred or suffered on account of anything contained in this bid or otherwise, including the accuracy, adequacy, correctness, completeness or reliability of the bid and any assessment, assumption, statement or information contained therein or deemed to form or arising in any way for participation in this bidding process.

6. The Bank also accepts no liability of any nature whether resulting from negligence or otherwise, howsoever caused arising from reliance of any bidder upon the statements contained in this bid. The information and statements made in this RFP have been made in good faith. Interested parties should rely on their own judgments in participating in the said Project.

7. The issue of this bid does not imply that the Bank is bound to select a bidder for the proposed work and the Bank reserves the right to reject all or any of the bidders or bidding process without assigning any reason whatsoever.

8. The bidders are expected and advised to examine all instructions, forms, terms and conditions in the document. Failure to furnish all information required by the bid document or to submit the documents not substantially responsive to the document in all respect will be at the applicant's risk and may result in rejection.

9. All Bidders are responsible for all costs incurred by them when evaluating and responding to this document including any negotiation costs incurred by the bidder thereafter. The bank may in its sole discretion proceed in the manner it deems appropriate which may include deviation from its expected evaluation process, the waiver of any requirements, and request for additional information. Unsuccessful bidders will have no claim whatsoever against the bank nor its employees, officers nor its consultants.

DEPARTMENT OF PREMISES, SECURITY AND PROCUREMENT

NATIONAL BANK FOR AGRICULTRURE AND RURAL DEVELOPMENT

HEAD OFFICE, MUMBAI

NOTICE INVITING PROPOSAL

Ref No. NB/ HO/ DPSP/ 39/ Basement/ 160778/ 2024-25 Date: 11.03.2025

Request for Proposal for "Design, Engineering, Procurement and Execution of Waterproofing and related Structural Repair works of Basement Floors in NABARD Head Office Building at BKC, Bandra East, Mumbai – 51.

1) NABARD (Bank) invites proposal from prospective bidders who are satisfying the eligibility criteria for pre-qualification, through online mode (e-tender) in Central Public Procurement Portal (CPPP) in two bid system for "Design, Engineering, Procurement and Execution of Waterproofing and related Structural Repair works of Basement floors in NABARD Head Office Building at BKC, Bandra East, Mumbai -51.

2) The tender document containing prequalification/eligibility criteria, scope of the works and specifications, terms and conditions of the contract and prescribed formats for submission of the bid can be downloaded from Bank's website www.nabard.org and CPP portal. No physical copy shall be provided by NABARD.

3) It may be noted that it will be a two bids system tendering wherein the first bid will be 'Technical Bid' and second bid will be the 'Price Bid'. Bidders are advised to submit e-tender (e-bids) through CPP Portal only, after carefully following the instructions related to systems and procedures as indicated in the CPP Portal. Please note that to submit e-tender through electronic mode, interested bidders should have Digital Signature Certificates (DSC) to login CPP Portal. In case of any further guidance, help and support while submission of e-bids, contact CPPP support available in the website.

4) The interested applicants/ bidders can upload their bids along with the application form for the bid provided in Annexure I i.e. Technical Bid (Section-I) & Price Bid (Section-II) along with duly signed scanned copies of all relevant documents in support of their bids, on the CPP Portal within the prescribed time limit. The evaluation of bids will be based on online bids submitted by bidders.

5) Technical Bid (Section-I) i.e., shall contain:

    a. Notice Inviting Proposal
    b. Earnest Money Deposit receipt of Rs. 4,00,000/- (Rupees Four Lakh Only)
    c. Duly signed Integrity Pact on Rs.200/- non-judicial stamp paper

d. Application Form of Bid
e. Duly filled Bid documents [Technical Bid] along with the supporting documents

6) Price Bid (Section-II)) shall contain:

a. Duly Priced Schedule of items for execution of the works.

a) A pre-bid meeting will be convened at 11.00 AM on 18.03.2025 at Department of Premises, Security and Procurement, NABARD, Head Office, G-Block, BKC, Mumbai-400051 and subsequently site visit will be arranged for the participants on the day. Bidders are requested to attend the pre-bid meeting in person. Clarifications if any on the bid may be sought from NABARD on or before 17.03.2025 by email to dpsp@nabard.org (Contact Person Name: Dharmaraj K, Assistant Manager & Phone No. 77081 78967). All queries will be clarified during pre-bid meeting and proceedings of the pre-bid meeting will be released on 20.03.2025 in NABARD website and CPP portal. Proceedings of the pre-bid clarification also forms part of the tender document. NABARD reserves the right to revise the conditions in the RFP document and/ or the Price Bid document after pre-bid meeting, if required.

7) Last date for submission of the bid is at 2.00 PM on 08.04.2025. Technical Bid of the bid will be opened at 3.00PM on 08.04.2025.

8) Technical Bid should be accompanied by EMD.

9) An Earnest Money Deposit (EMD) of Rs.4,00,000/- amount should be remitted to NABARD through RTGS/ NEFT as per the details given in Annexure II on or before 08.04.2025. Counterfoil/ receipt/transaction detail for the same must be enclosed with the technical bid document. The application without EMD shall be rejected out rightly. No interest is payable on the EMD. MSE firms having valid MSE/ Udyam Aadhar registration certificate are exempted from payment of EMD, on submission of valid MSE certificates in the category of construction works. EMD will be forfeited, if the bidder withdraws his tender before the expiry of the bid validity period or if the bidder fails to execute/ complete the works satisfactorily.

10) The tenderer/ bidder has to enter into the Integrity pact at his own cost on ₹200/- non judicial stamp paper with Bank as per the format given in Annexure III. Bank has appointed Independent External Monitor Shri Jagdeep Kumar Ghai, P&TA, FS (Retd) (Hereinafter referred to as Monitor) for this in consultation with the Central Vigilance Commission.

11) The Financial Bid should not contain any conditions whatsoever and any such conditional bids received shall be rejected.

12) Validity of the bids shall be 6 months (180 days) from the date of opening of Technical Bid.

13) The method of selection of the bidder is based on QCBS (Quality cum Cost Based Selection) as detailed in the selection criteria and evaluation methodology section of this RFP document.

14) The date for the technical presentation will be intimated separately through email to the shortlisted/ technically eligible bidders.

15) The financial/ price bids shall be opened after completion of presentation by the shortlisted bidders on a suitable date by the bank.

16) The prospective applicants are requested to visit the site of the work to understand its unique nature & need and/ or assess other technical parameters.

17) NABARD reserves the right to amend / withdraw any of the terms and conditions in the bid Documents or to cancel the tender process without giving any notice or assigning any reason thereof. NABARD also reserves the right to accept or reject any /all tender/s in part or whole of any firm / firms without assigning any reasons whatsoever.

18) The successful bidder shall execute an agreement with NABARD at his cost on non-judicial stamp paper worth of ₹200/- within 14 days from the date of issue of work order failing which the bidder's EMD may stand forfeited and the time period for completion of works is 8 months reckoned from the 14th day of issue of work order.

Yours faithfully

(Ajith K Pittan)

Deputy General Manager

Department of Premises, Security and Procurement

National Bank for Agriculture and Rural Development (NABARD)

Head Office

Mumbai-400051

Pre-Qualification Criteria for the bidders

The bidder shall fulfil the following eligibility criteria for participating in the tender. Non-production of the documentary evidence for the same will make the bidder liable for rejection.

S. No.	Description
1.	The bidder should have experience of executing Waterproofing and Structural Repairs of underground/ basement RCC structure of civil infrastructure for rehabilitating the existing structures during the last 7 years as on 31.12.2024. Work Experience Details clearly indicating services provided to Government Departments /PSUs/Autonomous Bodies/ Corporate Bodies such as Copies of Purchase Orders and related completion certificates received from the respective Government Departments / PSUs / Autonomous Bodies / Corporates during the last seven years should be enclosed / uploaded with technical bid. **Following documents should be submitted showing minimum 7 years' experience in the relevant field:** 1. Copy of work order (s) /Contract document (s) and 2. Completion Certificate (s) issued by the clients against the above work orders.
2.	Bidders should be a sole entity registered in India and not a Joint Venture or Consortium. **Following documents should be submitted:** 1. Registration Certificate as per existing norms (indicating the legal status – Company / Partnership firm/ Proprietorship Concern, etc.) 2. Certificate of Incorporation of the firm / company 3. Copy of GST Registration Certificates and Copy of PAN Card
3.	The bidder should have successfully completed at least: a. three similar works with individual work value costing not less than ₹80 Lakhs (or) b. two similar works with individual work value costing not less than ₹1 Crore (or) c. one similar work of value costing not less than ₹1.6 Crore during the last 7 years as on 31.12.2024. **Definition of Similar Works**: Similar work means execution of extensive and comprehensive or specialized Waterproofing and structural repairs works of

	underground/ basement RCC structure of civil infrastructure for rehabilitating the existing structure Government / Semi-Government / Public Sector Undertakings / Multinational Organizations/ Banks/ Corporate Offices/ Financial Institutions. **Following documents should be submitted:** 1. Copy of work order (s) /Contract document(s) and 2. Completion and Performance Certificate issued by the clients as against the above Work orders. 3. In case of works for organizations other than Central/ State Government, and Central/ State Government Undertakings, TDS certificates and proof of other statutory payments made for the project to be submitted.
4.	Basic Information about the Organization in the format as enclosed in Annexure IV.
5.	Organizational set up of the firm including names, qualifications and experience of partners/ Associates and staff including their memberships with relevant professional bodies to be enclosed as per the format in Annexure V
6.	Minimum Average Annual Financial Turnover of the bidder (For the last 3 years ending 31.03.2024) - Rs. 60.00 lakhs. The bidder should not have incurred a loss (profit after tax should be positive) during the last 3 financial years ending 31.03.2024. **Following documents should be submitted:** 1. Documentary evidence in the form of certified Audited Balance Sheets and Profit and Loss Statement of relevant periods (2021-22, 2022-23 & 2023-24) and a certificate from the Chartered Accountant / Cost Accountant indicating the turnover details for the relevant period as per the format in Annexure VI. 2. Copies of Income Tax Return filed for last three financial years ending 31.03.2024
7.	The bidders should not have been debarred'/ blacklisted by their clients as on the last date of submission of the bid. **Following documents should be submitted:** The bidder should submit undertaking in their letter head stating that his / their/her firm is not blacklisted in NABARD/ Govt. / Semi Govt. institutions/Corporates. The undertaking/affidavit should be of latest date as enclosed in Annexure VII.
8.	The bidders should submit the Details of important works/ contracts executed by them (value more than Rs. 80 Lakhs) during the last 7 years as per the enclosed

	format in Annexure VIII along with copies of Work Completion Certificates issued by the clients.
9.	The bidder should submit the details of important ongoing works/ contracts being executed by them (value more than Rs. 80 Lakhs) as per the enclosed format in Annexure IX along with copies of Work orders issued by the clients.
10.	The bidder should submit the declaration as per Annexure X.
11.	The bidder should submit the duly filled pro-forma furnishing the payment details as per Annexure XI.
12.	The bidder should submit a signed Indemnity Bond on a Rs.200/- non-judicial stamp paper as per the format in Annexure XII.
13.	Valid MSE/Udyam Aadhar certificate against the Works if seeking exemption from EMD
14.	Bidders have to disclose whether they are intended to use/adopt generic conventional materials/techniques or patented technology/materials developed by them. Bidders who intended to use the patented products/techniques developed by them for the work, need to provide copy of patent registration certificate issued by the relevant authority and provide certificates from the clients (Government and Corporate Organisations) about the successful application of these materials/techniques in their similar projects. Besides, the bidders have to disclose the constituents of the patented materials to be used in the proposed project.

Section 1: Background and Project Brief:

1. Objective:

National Bank for Agriculture and Rural Development (NABARD), having its head office at Plot No. C-24, G Block, Bandra Kurla Complex, Bandra East, Mumbai – 400 051, intends to carry out a comprehensive "Water Proofing Treatment and related Structural Repair Works" in the Basement area of its Head Office building through EPC mode.

2. Brief Description of the project:

The Head Office building of NABARD was constructed in the year 2002 in the reclaimed land where water table is generally high. There are two levels of basement at our Head Office with an approximate total built-up area of 1 lakh Sq. ft. (Upper basement - 75,000 sq. ft. & Lower basement - 25,000 sq. ft. approx.) The Basement is spread over the entire plot area with the setback of 3m from the plot boundary line. The Upper basement is an exclusive car parking floor with dedicated entry and exit ramps, while the lower basement houses important mechanical installations like firefighting system, STP, HVAC units, fire and domestic water storage tanks required for the efficient functioning of the building. The superstructure of the office building had been constructed on the middle portion of the basement area leaving the podium area for internal road around the office for maneuvering the vehicles, garden and plantation. The soil filling on the basement slab varies from 60cm. to about 120cm. Big trees like palm tree, Jack fruit tree etc. and small garden plants were planted above the basement soil filling. Over a period, dampness and seepage/leakage was observed at many points in the basement floors such as basement slab (roof of basement), diaphragm/retaining wall, expansion joints, lower basement floor and resulted corrosion induced cracks on beams/columns/slabs and spalling of the concrete. The situation in the basement is alarming during monsoon such as severe water seepage and dampness through walls & slab and rising & accumulation of ground water on lower basement floor leading to potential structural damage. To address the structural concerns and ensure the long-term integrity of the building, comprehensive waterproofing works and structural repairs in the basement are required.

This RFP is for addressing the above distress and restoration of the basement and also adopting preventive measures against possible future distress through systematic scientific approach and methodology as follows:

i. Detailed survey and thorough inspection of the building to identify areas of water entry and assess structural integrity.

ii. Designing the appropriate waterproofing treatment methodology and application of water proofing treatment in the areas of water stagnation/ leakage/dampness with 10 years minimum performance warranty for the treatment being carried out.
iii. Uprooting of deep-rooted trees above the basement slab. The bank has already submitted an application with the MCGM (Municipal Corporation of Greater Mumbai) for obtaining permission to uproot the trees above the basement slab. The bidder is required to follow-up with MCGM, obtain the permission and uproot the trees.
iv. Execution of works of Structural repairs of cracks and damaged structural elements.
v. Restoration of damaged finishes and surfaces in the basement.
vi. Expansion joint repair works
vii. Identify the possible distress in the basement area in future time using latest available technology and treat the area accordingly.

Layout of basement floors, relevant portions of the report of the structural audit of NABARD, Head Office building conducted in 2019, IITB report on the condition of the basement conducted in the year 2019 and photographs of the distressed area at different locations of the basement floors along with the distress mapping of basement floors are enclosed in this document for reference.

The above reports in the Appendix are only for reference purpose. The selected bidder should carry out detailed site investigation by engaging technical experts in the relevant field and make own assessment about the root cause of the basement dampness/ leakages and structural deterioration and suggest remedial measures and methodology of the treatment in the DPR for approval of NABARD.

Section 2: Scope and Specifications for the works

1. Scope of Work and Key Deliverables

The scope of work of the bidders/selected bidder is broadly divided into two stages i.e., pre-tender works and post-tender works. It is necessary that the contractor shall carry out a detailed survey and assessment of the basement area to prepare and submit a detailed methodology and specifications for each item of works to be carried out for the required "Water proofing treatment and Structural repair works" in the technical bid submission.

I. Pre-tender Works:

1. Preliminary Works and Assessment:

i. Site Survey and Inspection:
   a. Conduct a comprehensive site visit to understand the project scope.
   b. Conduct a preliminary site survey and inspection to assess the existing condition of the basement.
   c. Identify the root cause and source of dampness/water leakage/seepage, cracks, joints, and potential weak spots.
   d. Inspect external drainage systems and storm water sewers for any leakage into the basement area.
   e. Inspect the podium area above the basement, surveying and pinpointing of causes of water seepage into basement.

ii. Structural Assessment:
   a. Inspect the basement structural elements for identification of structural damages.
   b. Assess and evaluate the severity of cracks/gaps/damaged expansion joints and spalling of concrete of the identified damaged structural elements for the treatment.

2. Methodology and Estimate for the works:

i. Repair Methodology to adopt:
   a. Most suitable and effective waterproofing methodology with a 10-year performance warranty to be adopted for the treatment work by the bidders as per their expertise, previous work experience and repair methodology suggested by IITB in its report.
   b. The selected methodology shall use materials having a proven track record and shall be compatible with the existing structure.

c. The bidders shall also develop customized water proofing solutions to address certain areas facing challenges like high water pressure/ingress and soil conditions.

ii. Estimate for the work:

a. The contractor shall estimate the cost for the works including materials, workmen, surface preparation, application, treatment, excavation, removal of soil filling, uprooting of trees and plants, refilling of soils after treatment, dismantling & removal of concrete pavement/foot path as per the requirement and reinstating after the treatment, supplying & erecting scaffolding and other required items to complete the works in all respects for submitting the financial proposal (Price Bid).

II. Post-tender works:

A. After shortlisting of bidders:

1. Presentation:

i. The shortlisted contractors based on technical eligibility shall make a presentation before the committee of the bank constituted for technical evaluation of the bids.

ii. The presentation shall inter-alia cover the present condition of the basement, proposed water proofing treatment technologies and structural repair technology, adequacy of the proposed approach, previous experiences and work plan for executing the project.

iii. The presentation shall be made to explain the detailed technical specifications and execution methodology to be adopted by the bidders along with the list of makes of materials for effective execution of the works.

2. Sample Waterproof Treatment by the bidders who are using own patented product:

Shortlisted bidders who have developed patented technology and materials for the water proofing treatment, shall have to demonstrate treatment at a distressed location identified by NABARD on a sample basis to prove the effectiveness of their technology.

B. After Issuing Work Order to the selected Bidder:

1. Detailed Site Survey and NDT tests:

i. Carry out detailed surveys, investigations [required Non-Destructive Tests (NDT) for determination of structural integrity and Moisture tests using equipment like thermal/ infrared scanner on walls, floors and ceiling/slab to identify damp/ seepage areas), laboratory tests, analysis and studies including collection of other relevant data as necessary for assessing the existing condition of the basement i.e., level of structural damages like cracks, settlements, spalling of concrete, etc. and intensity of water seepage issues in the structure and accurately identify & pin point the areas requiring repairs and

waterproofing treatment. All the tests are required to be conducted from NABL accredited laboratories only.

ii. Identify the root causes of water infiltration, damages like cracks, spalling of concrete, damage of expansion joints, and potential weak spots.

2. Interaction with NABARD (Bank):

i. Based on the above site investigation of the bidder and considering the repair methodology suggested by IITB report, the bidder shall have to derive effective repair methodology to address the issues. Accordingly, the bidder shall submit an initial report summarizing their findings and offer a preliminary recommendation for the type of waterproofing system and structural repairs to be adopted in the project.

3. Selection of Technology and Repair Methodology:

i. The bidder shall finalize the appropriate waterproofing and repair methodology based on the site survey and area specific requirements and will present before NABARD for taking necessary approvals.

ii. The bidder shall submit a "Detailed Project Report (DPR)" of the proposed waterproofing and repair work. The report shall include:
    a. Specification of the materials proposed including brands, types and technical data sheets for each material.
    b. Details of the application methodology, including preparation, application procedure, method of curing, curing times etc. to be adopted for carrying out the work.
    c. Proposed timeline for the project highlighting major milestones, including start date, dismantling, and completion of surface preparation, application, testing and handover.
    d. Detailing of QAP (Quality Assurance Plan) and QCP (Quality Control Procedures) to be adopted for ensuring that the works meet industry standards and manufacturers specifications
    e. Safety plan and measures to be adopted, including PPEs for workers, handling of chemicals as per MSDS and adherence to the construction safety regulations.

iii. The bidder shall make a presentation on the DPR including the proposed repair methodology with working schedule, before the bank and clarify any doubts that arise during presentation.

iv. The bidder shall finalize the waterproofing and structural repair methodology for execution and obtain it's approvals from the bank.

4. Execution of works:

i. Site Preparation works:

a. The bidder shall remove or shift any items or equipment which may obstruct the work from the work area to designated area identified by the Bank and ensure unobstructed access to all the distressed surfaces for treatment. The removed materials may be safely stored in the allotted place and the same may be reinstalled after completion of works.
b. However, if shifting of any utility line is required to be done for carrying out the work, the bidder shall do so by providing temporary alternative arrangements without hindering the function of the office building and the permanent service connection may be restored on work completion.
c. The bidder shall secure all prior approvals required for the commencement of works from the statutory authorities.

ii. Material and Equipment mobilization:

a. The bidder shall procure required quantities of all approved materials for waterproofing and structural repair works, ensuring they meet the standards and specifications.
b. The bidder shall mobilize all necessary equipment and tools required for the projects.

iii. Engagement of sub-contractors/ consultants:

a. The contractor (bidder) may engage and manage any required sub-contractors/ consultants for specialized works/ services, in case of absence of in-house expertise or requirement based on their needs with the approval of the bank.

iv. Approval from MCGM:

a. The contractor shall liaise and follow-up with MCGM for obtaining permission for uprooting of trees above the basement slab at the earliest, if required as per the approved methodology for waterproofing treatment.
b. The contractor shall also uproot the trees from the slab and carry out necessary repairs or waterproofing works for the slab.
c. The statutory charges to be paid to MCGM and any plantation to be done for compensating the trees uprooted from the premises shall be reimbursed by the bank on production of bill. However, there shall be no additional payment to the contractor for the liaison works and visits to the offices and it shall be included within the quoted price for the project.

v. Treatment works to be carried out:

a. The bidder shall thoroughly clean all surfaces to be treated by removing dirt, dust, oils or other contaminants for proper adhesion and performance of the materials.
b. The bidder shall repair cracks, gaps and joints with approved sealant or fillers and level the surfaces, including filling of holes or depression to ensure uniform application of the waterproofing materials.

c. The bidder shall carry out necessary structural repairs, including joint repairs, reinforcement coating, and any other damages to restore structural integrity.
d. The bidder shall adopt Waterproofing treatment of the basement area i.e., application of the selected waterproofing membrane or coating system or grouting with approved materials as per the approved methodology with the highest standards of quality and safety.
e. The bidder shall ensure the correct thickness and consistency of the applied layers as per product guidelines and water-tight seals around basement vents, duct penetrations, and utility conduits.

vi. Testing & Quality Assurance:

a. The bidder shall conduct water leakage/dampness testing post-application to ensure the waterproofing system is fully effective.
b. The bidder shall use pressure testing, water spray tests, or other methods to identify any potential failures or weak spots.
c. The bidder shall test for water tightness expansion of joints and seals.
d. The bidder shall inspect the entire waterproofing system for any defects, including porosity, uneven application, or incomplete coverage.
e. The bank shall also appoint or engage Third Party Quality Auditors or any other consultants for inspection of the structural repairs and waterproofing treatment works carried out in the basement.
f. The bidder shall address any issues or deficiencies found during the inspection by the bank or the appointed third-party quality auditor/ consultant.

5. Final Completion and Handover:

i. The bidder shall clean the work area including its influence area at the end of everyday work and remove the debris to the designated area approved by the bank inside the premises and dispose the debris to municipal dump yard periodically. Besides, the bidder shall clean the site thoroughly after completing the works in all respect, ensuring all debris, tools, and equipment are removed from the site and dispose the debris in the municipal dump yard.
ii. The bidder shall restore any landscaping or site features disturbed during the work.
iii. The bidder shall conduct a final inspection with the bank representative to ensure that all work have been completed per the agreed scope and specifications.
iv. The bidder shall address any punch list items or minor adjustments identified during the inspection.
v. The bidder shall submit a detailed report outlining the works carried out and confirming the areas covered under warranty.

vi. The bidder shall provide all necessary documentation, including the warranty certificate, material specifications, installation guidelines, and maintenance recommendations.

6. Warranty and Post-Completion Works:

i. The bidder shall provide a formal 10-year performance warranty for the waterproofing works, ensuring coverage for material failure or workmanship defects.
ii. The warranty will include repair or replacement of any failed application during the warranty period at the risk and cost of the bidder.
iii. The bidder shall provide recommendations to the bank for regular maintenance and care to ensure the longevity of the waterproofing system.
iv. The bidder shall address any complaint issues on the waterproof treatment that arise during the warranty period promptly.

2. Specifications for repair of structural elements

The following specifications/ methodology are to be generally followed for repair of structural elements. However, the contractor is free to suggest more advanced technology, specifications and repair methodology and obtain necessary approval from NABARD.

I. Structural Repairs using Micro Concrete:

The repairs using pre-packed dual shrinkage compensated, free-flow, cementitious micro concrete shall be carried out in the distressed elements where the area of damage is large viz. beams and columns having damaged area of more than 50% of total surface area or having two sides damaged and Slabs having area more than 1 sq. m or depth of the damage in the RCC member is more than 30mm.

Micro concrete: The duel shrinkage-compensated, cementitious micro concrete shall be a high flow, single component cementitious formulation. The repair micro concrete shall have compressive strength minimum of 25 MPa at 3 day and 40 MPa at 28 days.

Repair Methodology:

a. Surface Preparation:

The elements that require repairs shall be identified and marked. The weak dilapidated concrete cover surrounding the elements shall be chipped and removed. The depth cutting of concrete shall be extended beyond the longitudinal steel by at least 10mm. The exposed core concrete shall be mechanically abraded to remove all loose material, followed by intense cleaning with clean, potable water to get rid of all organic impurities. Before proceeding further, it is to be confirmed that the concrete affected by carbonation was completely removed.

b. Reinforcement Protection:

The existing steel bars shall be mechanically abraded to remove all loose rust, scales and other corrosion products. The cleaned bars shall be checked for loss of cross section. The bars whose cross-sectional area was reduced by more than 25% shall be retrofitted with new bars of same diameter. Both the new and existing bars shall be given anti-corrosive treatment by applying two coats of alkaline rust convertor followed by two coats of anti-corrosive rust passivator (Zinc rich epoxy) after thorough cleaning of the rusted steel. Apply alkaline rust convertor in 2 coats with an interval of 6 hours between each coat and air cure for 6 hours. Remove loose rusts by scrubbing or with brush and wash the reinforcement with potable water and dry the reinforcement. After detachment of loose scales of reddish rusted surface is still left exposed, this must be retreated or as per approved manufacturers specifications. After 24 hours of cleaning and drying the reinforcement, applying zinc rich epoxy coating on the treated reinforcement and left for drying.

c. Application of Corrosion Inhibitor:

The prepared concrete substrate shall be given two coats of bipolar concrete penetrating corrosion inhibitor at the manufacturer specified application rate for two coats. The corrosion inhibitor shall be applied to the prepared substrate using brush or knap sack spray to cover the entire area. The first coat shall be allowed to penetrate deeply before applying the second coat. The corrosion inhibitor shall be free from nitrite, chromates phosphates & other toxic elements with bipolar inhibition mechanism property (B.I.M) to provide protection to the steel. Material shall have evaluated test reports indicating significant reduction in corrosion rate after minimum of 90 thermal cycles at 60 degrees Celsius followed by 8 weeks of accelerated corrosion.

d. Provision of Shear Connectors:

The damaged area shall be provided with 'L' shaped shear connectors using 8mm diameter HYSD bars. The shear connectors are fixed at 250mm c/c and at locations or as directed by structural engineer. The shear connectors are fixed by drilling holes of 12mm diameter into the concrete up to a minimum depth of 75mm using heavy duty drill machine. The drilled holes are cleared of any loose material followed by fixing with high performance epoxy based anchoring system (Styrene free Polyester Resin). The shear connectors are driven into the grouted holes filled with the anchoring resin and held for few minutes to make them fix in position.

e. Provision of Additional Rebar:

The reinforcement bars that have lost large cross-sectional areas and/or completely corroded shall be replaced or retrofitted with bars of same diameter. For columns the longitudinal reinforcement shall be anchored into the foundation concrete. For beams the longitudinal reinforcement shall be anchored into the connecting columns. The shear reinforcement for the beams shall be provided

by anchoring 'U' shaped bars into the slab at required spacing. All anchoring mentioned here are to be done with epoxy anchoring system.

f. Application of Bonding Coat:

The prepared substrate should be pre- soaked, preferably for 24 hours, but at least 2 hours before applying the bond coat. The surface must be saturated surface dry, but without standing water. Thus, the prepared substrate shall be provided with Structural Grade epoxy-based bonding agent by brush. The bonding agent shall be carefully applied before applying each layer of repair mortar covering all corners and depressions and avoiding over application. The bonding agent shall remain tacky till the micro concrete is poured. The structural grade bonding agent shall be a two component, solvent less epoxy resin based. It shall be formulated to meet the requirement of ASTM C881. The Bonding agent shall exhibit minimum open time of 6 hours and shall exceed the tensile strength of concrete in terms of its adhesive bond strength.

g. Mixing:

Only full bags are mixed. Damaged or opened bags should not be used. Mix the ready-mix Micro Concrete in a forced action pan mixer, or with a helical paddle attached to a low speed (300-600rpm) mixer for 3 minutes until a lump free, flowable consistency is achieved. Only use clean water. Mixing water needed: 3.25 to 3.75 litres per 25kg bag or as recommended by the Manufacturer of Micro Concrete. Allow the mortar to rest for 2 - 3 minutes and then remix briefly before pouring into formwork. If temperature more than 40°C then use chilled water for mixing.

h. Pouring of Ready Mixed Micro concrete:

The primed area shall be filled with ready mixed single component, dual shrinkage compensated micro concrete after fixing the formwork as per requirement. The formwork shall be made of either plywood or steel. In both the cases, before pouring of micro concrete all probable leakage points shall be sealed using suitable sealing compound. The micro concrete shall be mixed strictly following the w/p ratio mentioned in the datasheets of the manufacturer. The mixed micro concrete shall be poured into the formwork from one side of the formwork while gently tapping the sides of the formwork. The mixed material shall be placed into the formwork within 20minutes from the time of application of the bond coat. A hole of 75mm diameter shall be drilled through the slab to enable pouring of concrete into the beams, slabs and top section of concrete. The concrete filling shall be continued till hole is completely closed. The number and location of the pouring holes shall be decided depending on the distance or area to be covered by micro concrete.

i. Curing of Repair:

The repaired area shall be given a coat of single component acrylic based curing compound using brush and giving a continuous coat. The product shall comply with ASTM C 309 Class Bet The

product shall exhibit water loss not more than 0.55 kg/m2 in 72 hours when tested as per ASTM C156.

j. Protective Plaster:

The repaired surface shall be matched to the surrounding surface by providing required thickness of plaster internal or external plaster with cement mortar 1:3 added with synthetic fibre (1-3% by volume) as per manufacturer's specification.

II. Structural Repairs using Polymer Modified Mortar (PMM):

The repairs using pre-packed, single component, dual shrinkage compensated, high strength, cementitious repair mortar shall be carried out in the distressed elements where the area of damage is smaller than earlier condition mentioned for micro concrete repairs viz. Beams and Columns having only one side damaged and Slabs having an area of less than 1 sq. m.

Polymer Modified Mortar: The duel shrinkage-compensated, cementitious patch repair mortar shall be a single component mortar modified with fibers. The repair mortar shall exceed compressive strength of 35 MPa at 7 day and 45 MPa at 28 days. The repair mortar shall have thixotropic consistency, when mixed.

Repair Methodology:

a. Surface Preparation:

Loose, delaminated concrete should be removed until the substrate consists of sound concrete. Where corrosion of the reinforcement exists, continue bulk removal along the reinforcing steel and adjacent areas with evidence of corrosion-induced damage that would inhibit bonding of repair materials. Bulk concrete removal should include undercutting the corroded reinforcing steel by approximately 19 mm. The shape of the prepared cavity should be kept as simple as possible-generally square or rectangular in shape. The edges of the patches should be saw cut perpendicular to the surface to a depth of 13 mm to avoid feather edging the repair material. Mechanically abrade the surface to remove residual dust, debris, fractured concrete, and contaminants that prevent proper bonding. Blowing with oil-free compressed air or alternately, the use of a vacuum, may be appropriate if dust is still present after the blasting. The final surface texture should be rough, with approximately 6 mm amplitude.

b. Reinforcement Protection:

The existing steel bars shall be mechanically abraded to remove all loose rust, scales and other corrosion products. The cleaned bars shall be checked for loss of cross section. The bars whose cross-sectional area was reduced by more than 25% shall be retrofitted with new bars of same diameter. Both the new and existing bars shall be given anti-corrosive treatment by applying two

coats of alkaline rust convertor followed by two coats of anti-corrosive rust passivator after thorough cleaning of the rusted steel. Apply two coats of alkaline rust convertor with an interval of 6 hours between each coat and air cure for 6 hours. Remove loose materials by scrubbing or with brush and wash the reinforcement with potable water and dry the reinforcement. After detachment of loose scales of reddish rusted surface is still left exposed, this must be retreated or as per approved manufacturers specifications. After 24 hours of cleaning and drying the reinforcement, applying zinc rich epoxy coating on the treated reinforcement and left for drying.

c. Application of Corrosion Inhibitor:

The prepared concrete substrate shall be given two coats of bipolar concrete penetrating corrosion inhibitor at the manufacturer specified application rate for two coats. The corrosion inhibitor shall be applied to the prepared substrate using brush or knap sack spray to cover the entire area. The first coat shall be allowed to penetrate deeply before applying the second coat. The corrosion inhibitor shall be free from nitrite, chromates phosphates & other toxic elements with bipolar inhibition mechanism property (B.I.M) to provide protection to the steel. Material shall have evaluated test reports indicating significant reduction in corrosion rate after minimum of 90 thermal cycles at 60 degrees Celsius followed by 8 weeks of accelerated corrosion.

d. Application of Bonding Coat:

The prepared substrate should be pre- soaked, preferably for 24 hours, but at least 2 hours before applying Polymer Modified Mortar. The surface must be saturated surface dry, but without standing water. Thus, the prepared substrate shall be coated with polymer based bonding coat (polymer latex bond coat) as per manufacturer's specification by brush. The bonding agent shall be carefully applied before applying each layer of PMM covering all corners and depressions and avoiding over application. The bonding agent shall remain tacky till the repair mortar is applied.

e. Mixing of Polymer Modified Mortar:

Only full bags are mixed. Damaged or opened bags should not be used. Mix the ready-mix Polymer Modified Mortar in a forced action pan mixer, or with a helical paddle attached to a low speed (300-600rpm) mixer for 3 minutes until a lump free, thixotropic consistency is achieved. Only use clean water. Mixing water needed: 3.75 to 4.25 liters per 25kg bag or as recommended by the Manufacturer of Polymer Modified Mortar. Allow the mortar to rest for 2 - 3 minutes and then remix briefly before pouring into formwork. If temperature more than 40°C then use chilled water for mixing.

f. Repair with Ready mixed PMM:

The primed area shall be filled with single component, shrinkage compensated, fiber reinforced, and thixotropic cementitious repair mortar. The material with its excellent grab and good binder

properties allows application in layers of 50mm in vertical and 25mm in overhead applications. Apply to the desired layer thickness up to 15 mm in single layer and after hardening, provide second layer of required thickness (total up to 30 mm) and level using a screeding bar, trowel or wooden board. Bond coat shall be provided as per the recommendation of manufacturer between two layers of polymer Modified Mortar. Initially the material is filled into the cavity either by spraying or hand carefully compacting the same starting from center and moving towards the periphery. A thin scrape coat or contact layer before building up to the required thickness, wet on wet, will improve adhesion especially in case of hand application. The final layer shall be troweled to make it in line with the existing concrete surface. The material shall be mixed in quantities that can be consumed within ½ hr. from the time of mixing.

g. Curing of Repair:

The repaired area shall be given a coat of single component acrylic based curing compound using brush and giving a continuous coat. The product shall comply with ASTM C 309 Class Bet The product shall exhibit water loss not more than 0.55 kg/m2 in 72 hours when tested as per ASTM C156.

h. Protective Plaster:

The repaired surface shall be matched to the surrounding surface by providing required thickness of plaster internal or external plaster with cement mortar 1:3 added with synthetic fibre (1-3% by volume) as per manufacturer's specification.

III. Repairs with Epoxy Injection Grouting:

Grouting with low viscous epoxy grout after sealing the cracks with epoxy putty shall be carried out for elements without any indication of concrete getting de-bonded or the core concrete after removal of cover for repair was found to have cracks.

Epoxy Putty: The high strength non-sag epoxy compound shall be complying with ASTM C881. It shall be formulated to achieve adhesive bond strength with concrete substrate exceeding the inheriting tensile strength of concrete substrate; with compressive strength in excess of 60 MPa at 7 days.

Epoxy Grout: The two-component epoxy injection resin shall be a low viscosity resin system having viscosity less than 350 cps at ambient temperatures. The injection resin shall be high strength and shall develop compressive strength more than 55 MPa at 1 day & 65 MPa at 7 days. The product shall exceed 55 MPa in flexural strength at 7 days and shall exceed 15 MPa in slant sheer bond strength. The product shall have minimum pot life of 30 minutes ambient temperatures. The injection resin shall comply with ASTM C881. The injection resin must have pass rating for shrinkage test as per ASTM C881 and shall be impermeable.

Repair Methodology:

a. Surface preparation:

Clean the concrete surface, 2 cm on either side of the crack to ensure bonding of sealing materials used to seal the crack. Ideally, wire brushes shall be used to make the surface rough. Where the cracks are already filled with some material or concrete is found to be weak immediately next to cracks, the cracks need to be opened completely. In any case opening of crack in the form of V with top width of minimum 10mm and depth of at least 10mm would be very ideal to avoid future problems. Normally, a surface sealing of the crack would not help during the injection process. When the crack is cut open, using suitable tools, the muck and mud deposited over a time shall be removed mechanically.

b. Fixing of Packers:

At intervals, install packers of size 12mm diameter along the crack. For fixing the packer, holes of required diameter are drilled into the concrete up to a depth of at least 100mm. The packers are installed into the drilled hole and mechanically tightened to make them remain fixed. The periphery of the packer shall be sealed with epoxy putty.

c. Sealing the crack:

The opened crack between two packers shall be sealed with epoxy putty in paste type consistency. The material shall be carefully pressed into the crack to fill the entire depth of the crack and trowelled at the top making it in line with existing concrete surface. The epoxy putty shall be allowed to set completely before initiating the injection process. This would take typically 4 to 6 hours depending on the ambient temperature.

d. Injection of low viscous Epoxy:

Once the epoxy putty is completely set, the fixed packers shall be injected with two component, low viscous epoxy grout. The injection process shall be started from the widest part if it is a horizontal surface or from the lowest point if it is a vertical surface. The pressure to be maintained shall be a minimum of 7 kgs/sq.cm. Inject in each port or nipple (keeping all others closed except the next immediate one). When the resin starts flowing out of the next port/nipple, close it and continue injection until the pressure can be maintained. After maintaining the pressure for 1 to 5 minutes to allow for total penetration, close the port and then disconnect the pump. Continue the process until all the ports or nipples are similarly injected. The typical advantage of using packers for this injection is that they have a non-return valve at the mouth which will not allow the injected grout to flow back.

e. Packer Removal:

The injected packer shall be removed by simply cutting it at the line of concrete. The gap formed shall be sealed with two-part epoxy putty. The putty shall be allowed to cure before any further treatments.

IV. Water Sealing of Cracks and Joints using PU grouting:

Injection grouting using single component (with catalyst to adjust reaction time), hydrophobic polyurethane (PU) foam resin with super low-viscosity and fast reaction time and having high free expansion to stop water leakages/seepages from cracks/construction joints and expansion joints in RCC structures. The grout expands on contact with water to form a solid semi-flexible foam structure which fills the cavities inside the concrete mass to create a barrier against water penetration. The grout, being very low viscous, can penetrate into micro-cavities and cracks.

PU foam resin: The PU foam resin to be used for grouting shall be MDI-polyol prepolymer based on polyurethane chemistry. Viscosity of PU Foam resin shall be at least 165 mPa. s (cps at 250 C) for deep penetration into micro-cavities/cracks and joints. Catalyst shall be provided which can adjust the reaction to less than 20 seconds. The Reaction of PU foam resin shall start only after contact with water. The expansion ratio shall be at least 1500%. The structure of the foam formed shall be closed cell semi-flexible and shall be chemically resistant to weak alkalis, acids, etc. The Resin shall have good adhesion to mineral substrates such as concrete, bricks, stone, etc. The Foam shall have good compressive strength on curing to sustain any hydrostatic pressure.

Application Methodology:

a. Identify all cracks and joints having leakages/seepages in the structure.

b. Drill holes of 13 mm dia. up to 2/3rd depth of the structure, diagonally. The spacing between the holes shall be 300 mm and the grout holes shall be drilled in staggered pattern.

c. Install the Mechanical Packers in the drill holes by tightening the nut of mechanical packers by spanner. Ensure that the packer is held tightly in the hole. Patch the cracks and the hole by using Epoxy putty.

d. Take the resin from the container and empty into the hopper of pump and mix catalyst as per reaction time required. Connect the packer with the pump hose pipe using suitable fittings and inject the resin into the concrete mass until saturation pressure is reached. After completion of grouting clean pump using PU cleaner.

e. On completion of grouting after 7 days, remove all the packers by cutting and then patch the holes using Putty.

IV. Expansion Joint Repair works:

The contractor, as per the detailed site survey, shall finalize the most appropriate technology available in the market suitable for horizontal and vertical expansion joints of the structural members in the basement floors of NABARD, Head Office building. The repair methodology to be presented before NABARD for its approval, before starting the execution of works.

3. Specifications for waterproofing methodology

The contractor, as per the detailed site survey and analysis, shall finalize most appropriate treatment methodology based on the latest available technology in the market and submit a detailed project report along with detailed specifications.

The DPR for the treatment as a whole, (i.e. waterproofing and structural repairs), to be present before NABARD for its approval, before starting the execution.

Section 3: Selection Criteria and Bid Evaluation Methodology

The bank shall constitute a Tender Evaluation Committee for evaluation of bids. The committee reserves all rights to ask the bidders to submit any missing documents or ask for clarification on the documents submitted by the bidders so as to avoid disqualifying any bidder due to meager negligence. The committee shall exercise this right impartially, only if there is sufficient reason to do so, to protect the interest of the bank. Technical Bids and Financial Bids shall be evaluated separately by the committee and a combined score of both will be considered for selection of the successful bidder as detailed below:

Technical Evaluation:

1. The Bidders shall have to preliminary qualify as per document verification after opening the Technical Bid.

2. The bidders who are having patented technology developed own and preliminary qualified as per the document verification, must demonstrate effectiveness of their technology at specified area to be earmarked by NABARD at the worksite on sample basis.

3. The bidders who have been preliminary shortlisted as per document verification and proven patented technology as per para-1 & 2 respectively shall only be considered for shortlisting of the bidders for technical presentation.

4. Further marks are awarded on the minimum pre-qualifying criteria and above as per the parameters set out in the table below:

Sr No	Broad criteria/ Technical Parameter and marks assigned to each parameter	Maximum Marks
1	Experience of the bidder in executing similar type of work 7 to 10 yrs=3, 10 to 12 yrs =5, 12 yrs to 15 yrs=8, above 15 yrs =10	10
2	Experience of the bidder in executing Waterproofing & related structural repairs of existing RCC underground/ basement structure as EPC contract: a. Value of the single work from ₹80 lakh to ₹1.6 crore = 5 b. Value of the single work above ₹1.6 crore = 10	10
3	Maximum value (Project Cost) of any single project handled of similar nature of works during last 7 years as on 31.12.2024,	15

	a. Above ₹ 80 lakh up to ₹1.6 Crore =5, b. Above ₹1.6 crore and up to Rs. 4 crores =10 c. Above ₹4 crores =15	
4	Average Annual Financial Turnover during the last 3 years ending 31.03.2024 a. Above Rs. 60 Lakhs up to Rs. 3 Crores = 5 b. Above Rs. 3 Crores up to Rs. 5 Crores= 10 c. Above Rs. 5 Crores = 15	15
5	Nature of the client department for whom the bidder has successfully executed similar work/ project in the last 7 years as on 31.12.2024: CPWD or Government Engineering departments, All India Financial Institutions, Public Sector Banks/ Undertakings/ Autonomous / MNCs and Public Limited Companies = 15	15
6.	Area of expertise, where the bidder had successfully completed waterproofing work after completion of the structures: a. Basement waterproofing of RCC building having basement area less than 40,000 sq. ft. = 5 b. Basement waterproofing of RCC building having basement area more than 40,000 sq. ft. = 10 c. Waterproofing of Tunnels and Sub-ways built for highway, Roads, Railway and Aerodrome project = 15	15
	Total	**80**

Note: Relevant documentary evidence on the above-mentioned parameters shall be furnished along with the Annexures.

5. The bidders who have obtained a minimum of 50% i.e. 40 marks (out of 80 marks) as evaluated above shall be considered for technical presentation.

6. The bank will constitute a Presentation Evaluation Committee for evaluating the technical presentation made by the bidders and awarding marks (Maximum 20 marks) for each bidder based on their presentation for problem-solving approach, waterproofing and repair methodology proposed for execution, previous work experiences and efficacy of the proposed solution. The marks awarded by the committee will be final and binding on all bidders. No further representations from any bidder will be entertained in this regard. Matrix for awarding the marks as follows:

Sr No	Parameter for marking	Maximum Marks
1	Understanding about the Project in detail by the bidder	5
2	Approach to the issues, methods of assessing and general perception of root cause and solutions for problem solving.	5
3	Suggested methodology for effective water proofing and structural repairs.	10
	Total	20

7. The bidders who have obtained a minimum of 60% i.e. 12 marks (out of 20 marks) in technical presentation shall alone be considered for opening of price bid.

8. The total technical score obtained by the bidder is calculated as below:

S. No	Parameters	Maximum Marks	Marks Obtained
1	Marks as per the evaluation matrix	80	
2	Marks in the technical presentation	20	
	Total for Technical Evaluation	**100**	

Financial Evaluation:

1. The financial bids of only those bidders who have qualified in the technical evaluation shall be opened and evaluated.

2. L1 will be decided on the total cost quoted by the bidder including GST.

Bid Evaluation Methodology:

Bids shall be evaluated both in terms of 'Technical Evaluation' as well as 'Quoted Price' i.e., Quality Cum Cost Based Selection (QCBS) methodology. The weightage for the 'Quality' i.e., technical evaluation of the bid is 50 % and the weightage for the 'Quoted Price' i.e., financial bid is 50 %

1. **Technical Score of the bidder:**

   The marks obtained by the bidders in the technical evaluation shall be considered for the technical bid evaluation.

Technical Score of the bidders will be evaluated using the following formula.

Technical Score = (T x 50)/ T (high)

where T stands for actual marks secured by the bidder and T (high) stands for highest marks secured by the bidder.

Technical score shall be calculated up to two decimal places.

2. Financial Score of the bidder:

Financial score of the bidders will be evaluated using the following formula.

Financial Score = [(L1 x 50)/ (L)].

Where L1 stands for lowest rate quoted by the bidder and L stands for rate quoted by the bidder.

Financial Score shall be calculated up to two decimal places.

3.**Combined Bid Score:**

i. The technical and financial scores of each bidder will be added to compute a composite bid score.

Composite bid score = Technical score + Financial Score

ii. The bidder securing the highest composite bid score will be awarded the work.

iii. In the event of two or more bids having the same highest composite bid score, the bid scoring the highest technical score will be awarded the works.

iv. In the event of two or more bids having the same highest composite bid score and technical score, then the bidder having higher experience will be awarded the works.

Section 4: Instructions to the Bidders

1. No bidder will be allowed to withdraw his Tender during the validity period.

2. Intending / Interested applicants / bidders are required to submit the required details for the bidding process in a complete manner.

3. **Conflict of Interest**

Bidders in two or more different applications having controlling shareholders in common or the bidders that have a business or family relationship (as defined under Companies Act, 2013) with such members of the NABARD Staff who are directly or indirectly involved in this project shall not be considered for selection. Bidders found to have a conflict of interest will be disqualified. The Bank's decision shall be final in this regard.

4. **Code of Ethics**

A. The Bank requires that bidders observe the highest standards of ethics during the bidding process.

B. The Bank will reject a proposal for award of work if it is determined that the bidder recommended for award of work was engaged in corrupt or fraudulent practices in competing for the work. The Bank's decision shall be final and binding in this regard.

C. The Bank shall declare a bidder ineligible, either indefinitely or for a stated period of time from being awarded a contract(s), if at any time it is determined that the bidder was engaged in corrupt or fraudulent practices in competing for the award of work/contract or in executing the contract. The Bank's decision shall be final in this regard.

5. **Non-Disclosure clause**

a) The bidder shall treat all documents, information, data and communication of and with the Bank as confidential.

b) The successful bidder shall not, without the Bank's prior written consent, disclose the contract or any specification, plan, sample or information or data or drawings /designs furnished by or on behalf of the Bank to any person other than the person(s) employed by the bidder in the performance of the work.

c) Further, any such disclosure to any such person employed by the bidder shall be made in utmost confidence and should extend only so far as may be necessary and relevant

for the purpose of such performance and shall be subject to the terms and conditions of the non-disclosure clause.

d) The bidder shall not, without the Bank's prior written consent, make use of any document or information mentioned in these conditions of the bid except for the sole purpose of performing this bid.

e) The Applicant shall also furnish a declaration, inter-alia, undertaking to abide by this condition in **Annexure X**.

6. **Amendment to the bid document**

a) At any time prior to the deadline for submission of bid applications, the Bank either on its own or on the request of the Applicant/s may amend the bid Documents by issuing corrigendum/ addendum.

b) An Addendum/ Corrigendum issued under the above clause shall be part of the bid Documents and shall be posted on the Bank's website and CPP portal.

c) To give bidders reasonable time to take corrigendum into account in preparing their bid, the Bank may, at its discretion, extend the deadline for the submission of the bid Applications.

7. **Pre-Bid Meeting**

The Bank will arrange a pre-bid meeting with all the prospective bidders on the date, time and the address mentioned in the Notice for Invitation to clarify the points/ doubts. Bidders desirous of attending the meeting is/are requested to inform the names of participants along with their pre-bid queries if any, on or before 17.03.2025 by email addressed to dpsp@nabard.org

8. **Language of Application**

The language used in the Application as also in the supporting documents shall be in English. If any of the document's submitted as part of the bid is/are in the languages other than English, the bidder shall provide translation of such document's/certificates in English. In case of ambiguity, English version of the document/s shall prevail.

9. **Filling of Application Forms**

a) All information, as called for in the enclosed forms, shall be furnished against the relevant columns in the forms. If for any reason, information is furnished on a

separate sheet, this fact shall be mentioned in the relevant column/s. Even if no information is to be provided in a column, a 'nil' or 'no such case' entry shall be made in that column. If any particulars / queries are not applicable in case of any applicant, it shall be stated as 'not applicable'. The bidders are cautioned that not giving complete information called for in the bidding process or not giving it in clear terms or making any change in the prescribed forms or deliberately suppressing information may result in the bidder being summarily disqualified. Bids received late shall not be considered.

b) Notice inviting tender placed on the website, CPPP portal and released in Newspapers, is part of this document and shall be considered and interpreted for all purposes in connection with selection of the successful contractor for Design, Engineering, Procurement and Execution of Waterproofing and related Structural Repair works in Basement floors of NABARD Head Office Building at BKC, Bandra East, Mumbai – 51. The bidder may furnish any additional information, which is deemed necessary to establish its capability to successfully complete this project. Superfluous information need not be furnished, and no information shall be entertained after submission of bid document unless specifically called for by the Bank.

c) Any information furnished by any bidder if found to be incorrect either immediately on opening of the bid application or at a later date, shall render the bidder liable to be debarred from participating in this project.

d) If space in the proforma is found insufficient for furnishing all the required details, such information shall be supplemented on separate sheet/s stating therein the part of the proforma and Serial Number to which it relates. Separate Sheet/s shall be used for each part for the purpose.

e) Any letter or document, accompanying the pre-tender qualification form, shall be scanned and uploaded in the CPP portal. The bidder shall submit the originals for verification by the bank, if needed.

f) The bidder shall bear all costs associated with the preparation and submission of this bid Application. The Bank will in no case be responsible or liable for these costs, regardless of the conduct or outcome of the pre- qualification process.

g) The bidders are advised to submit the tender strictly based on the pre-qualification criteria, General Conditions of the Contract and Technical Specifications contained in the tender documents, and not to stipulate any deviations. If acceptance of the

terms and conditions given in the tender documents has any price implications, the same should be considered and included in the quoted price.

h) The bidder shall submit full details of the patent, trademark, registered design, intellectual property rights, copyrights, industrial property rights held by them or used by them of any third party with regard to design or any part of the system.

i) Tenderer are advised to use only the forms issued by NABARD. However, if they desire to submit additional information, they may do so on their own letter head / paper.

j) **Signing of the Application**: The Application shall be typed and signed on all the pages by the person duly authorized to sign on behalf of the bidder. The power of attorney duly notarized and on a stamp, paper authorizing the person/s to sign and act on behalf of the firm, shall be submitted. An authorized representative shall have the authority to conduct all business functions and incur liabilities related thereto for and on behalf of the bidder, during the pre- qualification process and thereafter.

k) **Deadline and Address for Submission of applications**: Bid applications shall be submitted via CPP portal in two separate parts i.e., technical bid and Financial Bid, before the final date for submission. The Applicants may note that under no circumstances, the bid applications should be submitted by email/ post at the address provided in the bid document.

l) **The bid shall be rejected summarily, on uploading duly priced financial bids along with the technical bids.**

m) The Bank may, at its discretion, extend the deadline for the submission of the bid Application, in which case all the rights and obligations of the Bank and those of the bidder, subject to the previous deadline, shall thereafter be subject to the deadline as extended.

n) The bid shall be evaluated on the basis of the application and the supporting documents submitted by them. The Bank shall not be under any obligation to seek any further information or clarifications from any applicant.

o) Without prejudice to the above clause, in order to assist in the evaluation of applications, the Bank may, at its sole discretion, ask any bidder for any clarification on its application, which shall be submitted by the bidder within a stated period of time.

p) If a bidder does not provide clarifications by the date and time specified in the Bank's request, its application shall be liable to be rejected.

q) Price bids of only those bidders qualified in the Technical bid will be opened for selection of contractor.

10. **Responsiveness of Applicants:**

a) An application, which does not meet all the requirements of the bid Document, shall be rejected forthwith and the Bank's decision shall be final in this regard.

b) The Applicants are advised that the selection of the contractor shall be entirely at the discretion of the Bank. Applicants shall be deemed to have understood and agreed that no explanation or justification of any aspect of the bid process shall be given by the Bank and that the results of the bid process shall be without any right of appeal to the Applicants, whatsoever.

c) All documents and other information submitted by an Applicant to the Bank shall become the property of the Bank. Applicants shall treat all information (which they come to have in connection with this project) as strictly confidential. The Bank shall not return any bid document submitted to it by the Applicants.

d) The Bank shall inform the applicant/s about the outcome after the due process is completed.

11. **Modifications/ corrections of applications**

a) No modification or substitution of the submitted application shall be allowed.

12. **Right to accept / reject any or all applications**

The Bank reserves the right to accept or reject any or all the applications and to annul the qualification process at any time without any liability or any obligation for such acceptance, rejection or annulment. The Bank's decision in the matter shall be final.

13. **Use of contract documents and information**

a. The applicant shall not, without the Bank's prior written consent, disclose the contract or any provision thereof including any specification, drawing, sample or any information furnished by or on behalf of the Bank in connection therewith, to any person other than the person(s) employed by the Consultant in the performance of the contract emanating from this bid. Further, any such disclosure to any such employed

person shall be made in confidence and only so far as necessary for the purposes of such performance for this contract.

b. Further, the applicant shall not, without the Bank's prior written consent, make use of any document or information mentioned in the contract except for the sole purpose of performing this contract.

c. Except the contract issued to the applicant, each and every other document mentioned in this bid document shall remain the property of the Bank, all copies of all such documents shall be returned to the Bank on completion of the consultant and obligations under this contract.

14. **Attachments/ Enclosures**

a) Applicants shall attach clearly marked and referenced continuation sheets if the space provided in the bid Document is found insufficient.

b) In responding to the bid application, Applicants shall demonstrate their capabilities in relation to the requirements of the project/work as envisaged, by providing materials/information based on their experience, past performance, their personnel and financial resources.

c) It is expressly clarified that before submitting the bid, the Applicant must have examined carefully the contents of all the documents and any failure to comply with any of the requirement of the bid document will be at the Applicant's risk only.

d) Evaluation of the applications shall be on the basis of bid application.

e) Only those applications, which meet the requirements of the bid Document, shall be processed further. Other applications shall be rejected.

f) The tenderer whose tender is not accepted shall not be entitled to claim any costs, charges, damages and expenses of and incidental to or incurred by him through or in connection with his submission of tenders, even though the bank may elect to modify/withdraw the tender.

16. Fraud and Corrupt Practices: -

16.1 The applicants and their respective employees, agents and advisers shall observe the highest standard of ethics during the bidding process. Notwithstanding anything to the contrary contained herein, the Bank shall reject an application or any such suggestion of applicant without being liable in any manner whatsoever to the applicant, if it determines that they have, directly or indirectly or through an agent, engaged in corrupt / fraudulent

/ coercive / undesirable or restrictive practices in the bidding process.

16.2 Without prejudice to the rights of the Bank hereinabove, if an applicant is found by the Bank to have directly or indirectly or through an agent, engaged or indulged in any corrupt/ fraudulent/ coercive/ undesirable or restrictive practices during the bidding process or during any course of the project, such applicant shall not be eligible to participate in any bids/ tenders issued by the Bank for the period as decided by the Bank.

16.3 For the purposes of this Clause, the following terms shall have the meaning hereinafter, respectively assigned to them:

a. "Corrupt practice" means

(i) The offering, giving, receiving, or soliciting, directly or indirectly, of anything of value to influence the actions of any person connected with the bidding process (for avoidance of doubt, offering of employment to or employing or engaging in any manner whatsoever, directly or indirectly, any official of the Bank who is or has been associated in any manner, directly or indirectly with the bidding process or the Letter of Authority or has dealt with matters concerning the Concession Agreement or arising there from, before or after the execution thereof, at any time prior to the expiry of one year from the date such official resigns or retires from or otherwise ceases to be in the service of the Bank shall be deemed to constitute influencing the actions of a person connected with the bidding process); or

(ii) Engaging in any manner whatsoever, whether during the bidding process or after the issue of the Letter of Authority or after the execution of the Agreement, as the case may be, any person in respect of any matter relating to the Project or the Letter of Authority or the Agreement, who at any time has been or is a legal, financial or technical adviser of the Bank in relation to any matter concerning the Project.

b. "Fraudulent practice" means a misrepresentation or omission of facts or suppression of facts or disclosure of incomplete facts, in order to influence the bidding process.

c. "Coercive practice" means impairing or harming or threatening to impair or harm, directly or indirectly, any person or property to influence any person's participation or action in the bidding process.

d. "Undesirable practice" means

(i) Establishing contact with any person connected with or employed or engaged by the Bank with the objective of canvassing, lobbying or in any manner influencing or attempting to influence the bidding process; or

(ii) Having a Conflict of Interest.

e. “Restrictive practice” means forming a cartel or arriving at any understanding or arrangement among Firm/Architect with the objective of restricting or manipulating a full and fair competition in the bidding Process/ Techno commercial evaluation of the design.

Section 4: General Terms and Conditions

1. **The bidder shall be deemed:**

b) To have inspected the Work Site and its surroundings and all available information relating thereto (including any such information provided by or on behalf of the Bank). The Work Site may be inspected by prior appointment. The appointment for the visit may be obtained through email: dpsp@nabard.org (Contact Person Name: Dharmaraj K, Assistant Manager & Phone No. 77081 78967)

c) To have satisfied itself, before submitting its bid, as to the form and nature of the Work Site and its surroundings, including the geological and subsurface conditions, the surrounding conditions, the extent and nature of work and materials necessary for the completion of the Works, the means of access to the Work Site and the accommodation it may require, and

d) Generally, to have obtained all necessary information as to risks, contingencies and all other circumstances which may influence or affect its bid.

e) To have taken into account, prior to entering into the Contract, any further information provided by the Bank.

f) No failure by the consultant to become knowledgeable about or to discover matters which affect the Works shall relieve it of its obligations under the Contract.

g) To have made all reasonable efforts to ensure that any information relating to the Work Site and its surroundings provided by or on behalf of the Bank is accurate, the Bank shall not be responsible for the accuracy or sufficiency of such information unless the Bank specifically states in writing that it does accept responsibility for the accuracy of a particular item of information.

h) The Bank shall not be liable for claims for additional payments under the Contract on account of matters affecting the Works, and/or any associated activities, which the bidder/ contractor:

i. should have determined and understood prior to submission of its bid for the performance of the Works on the basis of information provided by or on behalf of the Bank,

ii. Could reasonably be expected to have been aware of as an experienced waterproofing contractor in the field of works to be performed under the Contract.

2. **Letter of Award (LOA)/ Work order**

Within the validity period specified in this bid, the Bank shall issue a letter of award (LOA) to the selected bidder/ contractor by registered post at their address or through their registered email ID as given in the bid documents to enter into an Agreement in the Bank's prescribed format as per Annexure XIII for taking up the proposed work. The LOA shall constitute a binding contract between the Bank and the bidder/ contractor. LOA shall be accepted within a period of 7working days.

3. **Signing of Contract Documents/ Agreement**

The selected bidder/ contractor shall be bound to enter into an agreement in the Bank's prescribed format in Annexure XIII on Rs. 200/- non-judicial stamp paper as applicable at the time of execution of agreement, within 14 days from date of issue of letter of award by the Bank. The agreement shall be signed by the authorized signatory of the bidder. A copy of the Power of Attorney for authorized signatory shall be submitted. Stamp duty will be paid by the bidder.

4. **Confidentiality**

The Contractor shall treat the details of the Contract as private and confidential, except to the extent necessary to carry out obligations under it or to comply with applicable Laws. The Contractor shall indemnify NABARD for any loss suffered by them as a result of disclosure of any confidential information. The Contractor shall not publish, permit to be published, or disclose any particulars of the Works in any trade or technical paper or elsewhere without the written permission of NABARD.

5. **Earnest Money Deposit (EMD)**

The bidder must submit his bid with Earnest Money Deposit of Rs. 4,00,000/- (Rupees Four Lakhs Only) in the form of Direct Deposit in the Bank through NEFT/ RTGS and submit a copy of transaction receipt along with the technical bid. Bids not accompanied by EMD shall be rejected. Should the Invitation to RFP be withdrawn or cancelled by the Bank, which shall have the right to do so at any time, EMD will be returned. EMD of the unsuccessful bidder will be returned after award of the work to successful bidder. No interest is payable on the EMD. MSE firms having valid MSE/ Udyam Aadhar registration certificate are exempted from payment of EMD, on submission of valid certificate for the works.

6. **Initial Security Deposit (ISD)**

The selected bidder/ contractor shall deposit as initial security amount equivalent to 2% of the issued work order value/ accepted tender value, after the appropriation of the Earnest Money deposited. The successful bidder shall pay the initial security deposit within 10 days from the date of issue of the work order or before signing of the contract agreement, whichever is earlier. No interest is payable on this security deposit made with the bank. The initial security deposit, either in whole or in part thereof, shall be forfeited in the event of the Contractor's failure to observe any terms of this Contract/ or noncompliance with the conditions of the Contract. This forfeiture is independent of the liquidated damages provided for in the contract.

7. **Retention Money Deposit (RMD) and Security Deposit (SD)**

Apart from the initial security deposit to be made by the contractor as aforesaid, the retention money shall be deducted from running bills @ 5% of the gross value of bill amount in each running account bill. On virtual completion of the job, the bank shall declare the job to be virtually complete and during settlement of final bill, an amount equivalent to 5% of the total completed value of the work shall be retained by the bank as a Security Deposit after adjusting the initial security deposit and retention money deducted in the RA bills. Provided that the total security deposit, the initial security deposit amount plus the retention amount shall put together not exceed 5% of the total executed value of the project. Security Deposit (SD) will be released after defects liability period (DLP) of one year from the date of virtual completion of the project provided that all defects reported/ noticed during DLP is rectified satisfactorily by the contractor and against the submission of bank guarantee from a scheduled commercial bank for an equivalent amount valid for a period of 9 years from the expiry of DLP. This shall form the guarantee during the performance warranty period of 10 years from the certified completion of project. Further, the contractor shall submit a undertaking in respect of the performance warranty for waterproofing and related structural repair works for 10 years in a Rs. 200 non-judicial stamp paper as per the format provided in Annexure XIV, on virtual completion of the project. All repair costs during the aforesaid Performance Warranty Period shall be borne by the Contractor. If the Contractors do not carry out the rectification work during the Performance Warranty period, then the Employer shall have the right to get such defective work rectified after giving due notice in writing to the Contractor/s and recover the cost of such repairs from the amount so retained. No interest is payable in this amount.

8. **Time Schedule and Liquidated damages**

Time allowed for carrying out the work is 8 months and shall be strictly observed by the Contractor and it shall be reckoned from the 14th day of issue of work order. The work

throughout the stipulated period of the contract should proceed with all the due diligence and if the contractor fails to complete the work within the specified period, he shall be liable to pay liquidated damages at 0.25% of the value of the accepted tender for every week of his delay or part thereof in completion of work, subject to maximum of 5% of the value of the accepted tender value. The bidder shall, before commencing the work, prepare a detailed work programme in the form of Bar Chart which shall be submitted to NABARD for approval. The contractor shall submit a Bar Chart for completion of the work within the contractual completion period within the 10th day of Work Order. Such chart shall include all activities like the date of supply of material at site, completion of work etc.

9. **Insurances/ Compliances to Statutes**

The contractor shall take all relevant insurances at his cost within 10 days of issue of work order covering all kinds of risks till end of the contract period of the work, in the joint names of NABARD and the contractor (NABARD's name being first) and it shall take at least the following risk related policies:-Contractor's All Risk Policy at 1.25 times of the value of the contract. Workmen compensation policy for all the workmen of the contractor at site. Third party liability policy of Rs.30 lakhs in a year.

Note:

i. These policies shall remain valid for all the time during the currency of the contract till the issuance of the Virtual Completion Period. If these policies are not provided by the contractor, NABARD reserves the right to take the above insurance policies themselves and/ or recover the cost thereof from the bill of the contractor.

ii. The Contractor shall comply with the provisions of Contract, Labour (Regulation & Abolition) Act, 1970, Minimum Wages Act and all other Labour Laws and other Statutory Regulations (both Central and State) that may be enforced from time to time by the appropriate authorities. NABARD shall not be held responsible for any penalty on failure of the any Labour Regulations by the contractor.

iii. The Contractor shall be responsible to fulfil all the obligations in connection with the workers employed by the Contractor for the purpose of the Contract and all the Statutory and other liabilities, if any, including minimum wages, leave salary, uniform, ex-gratia, gratuity, ESI, Provident Fund, Workman Compensation, if any, etc. in connection therewith shall be on the Contractor's account and payable by the Contractor.

iv. Any act of indiscipline / misconduct / theft / pilferage / careless activities on the part of

any employee engaged by the Contractor resulting in any loss to NABARD in kind or cash will be viewed seriously and NABARD will have the right to claim damages or levy fine and / or terminate the Contract forthwith, if necessary.

v. The Contractor shall provide NABARD with documentary evidence from time to time, that he has taken all the insurance policies mentioned in the foregoing paragraphs and that he has paid the necessary premium for keeping the policies valid till the completion of work.

vi. All insurance to be effected by the Contractor or nominated sub-contractors, if any.

vii. The Contractor has to Add-on covers under this policy, if at all they are not included under the original policy like: Clearing and removal of debris; Damage to surrounding property not forming part of the contract work. Maintenance visit / extended maintenance cover to cover accidental loss or damage whilst carrying out any rectification during maintenance period and / or any amount incurred for rectification of such original defects or faults during construction.

viii. The Contractor should have valid License relating to his Contract and the workmen employed by the Contractor should also have the valid License and experience in their trade.

ix. The contractor shall indemnify and keep indemnified the Employer against all losses and claims, damages or compensation under the provision of the payments of Wages Act 1936, Minimum Wage Act 1948, Employer's Liability Act 1938, Workmen's Compensation Act 1923, the Maternity Benefit Act 1961, Bombay Shops and Establishment Act 1947, Industrial Dispute Act 1947, and the Contractor Labour (Regulation and Abolition) Act, 1970 and Employee's State Insurance Act or any modification thereof or any other law relating thereto and rules made there under from time to time or as consequence of any accident or injury to any workmen or other person in or about the work whether in the employment of the employer or Contractor or not, and also against cost, charges and expenses of any suit, action or proceedings what so ever out of such accident or injury of combination or any such claim.

x. The Contractor should obtain approvals, if any, necessary for the work from the statutory bodies on behalf of NABARD. The fees and other statutory charges, if any, will be reimbursed to the Contractor based on the original receipts produced to NABARD.

10. **Deployment of Experienced Personnel:**

i. During the execution of the work, the bidder/ contractor must deploy qualified

personnel having experience in executing similar kind of waterproofing and Structural Repair works.

ii. The Contractor shall employ technically qualified and competent supervisors for the work who shall be available (by turn) throughout the working hours to receive and comply with instructions of the bank. The contractor shall engage at least one experienced Engineer as site-in-charge for execution of the work. The contractor shall employ in connection with the work persons having the appropriate skill or ability to perform their job efficiently.

iii. The details of the Site-in-charge including bio-data and proof of educational qualification and experience must be shared prior commencement of the work. He must thoroughly understand all the traces entailed and be constantly in attendance, while the men are at work. Any directions, explanations, instructions or notices given by NABARD's Officer to Site-in-charge shall be deemed to be given to the Contractor and shall be binding as such on the Contractor. The In-charge should be able to read, write and speak English.

iv. No workmen below the age of sixteen years and who is not an Indian National shall be employed on the work.

11. **Delay in the performance of the contract and Extension of Time**

i. The time period of completion shall be deemed to be the essence of the contract and the contractor shall complete the works in all respects within the time schedule specified by the Bank as incorporated in the contract.

ii. Any unexcused delay by the contractor in maintaining its contractual obligations towards completion of work shall enable the Bank to terminate the Contract for default.

If in the opinion of the Bank the works be delayed

(a) by force majeure or

(b) by reason of any exceptionally inclement weather or

(c) by reason of civil commotion, local combination of workmen or strike or lockout affecting any of the building trades or

(d) by reason of proceedings taken or threatened by the dispute with adjoining or neighboring owners or public authorities arising otherwise than through the Contractor's own default or

(e) by the works or delays of other Contractors or tradesmen engaged or nominated by the Employer or the Bank's Officer or

(f) by reason of Bank's Officer instructions or

(g) from other causes which the Bank may certify as beyond the control of the contractor or

(h) in consequence of the Contractor not having in due time necessary instructions from the bank's Engineer for which he shall have specifically applied in writing, ahead of time, giving the bank reasonable time to prepare such instructions, the Bank may make a fair and reasonable extension of time for completion of the contracted works. shall as soon as may be given written notice thereof to the bank but the Design Consultant / Project Architect shall nevertheless constantly use his endeavors to prevent delay and shall do all that may reasonably has required to the satisfaction of Bank to proceed with work.

iii. In case of such strike or lock-out, the Contractor shall, as soon as may be, given written notice thereof to NABARD, but the Contractor shall nevertheless constantly use his endeavors to prevent delay and shall do all that may reasonably be required to the satisfaction of NABARD to proceed with the work. The Contractor shall take all practicable steps to avoid or reduce any delay in the execution and completion of the works.

iv. The contractor is required to apply to the Bank for extension of time and obtain the same before scheduled time of delivery. In case the consultant performs the works without obtaining an extension, it would be doing so at its own risk and no claim for payment against such report shall be entertained by the Bank.

12. **Terms/ Stages of Payment**

Following general conditions will apply for running account/ final bill payment:

i. The payment shall be made in Indian Rupees.

ii. The contractor shall submit the original invoice while claiming payment along with the relevant supporting documents for payment.

iii. The release of payment to the contractor will be linked to completion of the following milestones as under: (in terms of percentage of total lump sum amount quoted for the works)

S.No.	Deliverable / Milestone	% of total lump sum amount payable at this stage
1	Completion and testing of waterproofing and structural repair works in all respects at Lower Basement	10%
2	Completion and testing of waterproofing and structural repair works in all respects at Upper Basement Zone - 1	10%
3	Completion and testing of waterproofing and structural repair works in all respects at Upper Basement Zone – 2	10%
4	Completion and testing of waterproofing and structural repair works in all respects at Upper Basement Zone – 3	10%
5	Completion and testing of waterproofing and structural repair works in all respects at Upper Basement Zone – 4	10%
6	Completion and testing of waterproofing and structural repair works in all respects at Upper Basement Zone – 5	10%
7	Completion and testing of waterproofing and structural repair works in all respects at Upper Basement Zone – 6	10%
8	Completion and testing of waterproofing and structural repair works in all respects at Upper Basement Zone – 7	10%
9	Completion and testing of waterproofing and structural repair works in all respects at Upper Basement Zone – 8	10%
10	Completion and testing of waterproofing and structural repair works in all respects at Upper Basement Zone – 9	10%
	Total	100%

Note:

1. The above payments shall be made only after the successful completion of the works in all respects and testing of the completed works to the satisfaction of the Bank's engineer.

2. Running Account bills will be accepted for payment only on completion of a particular milestones of the project and no interim bills at any other time shall be entertained.

13. **Termination for Default**

i. The Contract can be terminated by NABARD on 7 days' notice if works are found to be unsatisfactory and if there is no improvement even after issue of three notices to

the contractor. In such cases, the contractor's EMD will be forfeited.

ii. Further, the contract can also be terminated by NABARD on the following grounds with 7 days' notice:

a. In case of breach of any terms and conditions attached to this contract, NABARD reserves its right to terminate this contract.

b. In case any of documents furnished by the Contractor is found to be false at any stage, it would be deemed to be a breach of terms of Contract making him/her liable for legal action besides termination of contract.

c. If the Contractor becomes insolvent or found to have offered any bribe in connection with the contract or the contractor fails to observe or perform any condition of this contract then notwithstanding any previous waiver of such default or action being taken under any other clause hereof NABARD may terminate the contract and recover from the contractor any loss suffered by NABARD on account of the contract being terminated.

d. Any act of indiscipline / misconduct / theft / pilferage / careless activities on the part of any employee engaged by the Contractor resulting in any loss to NABARD in kind or cash will be viewed seriously and NABARD will have the right to claim damages or levy fine and / or terminate the Contract forthwith, if necessary.

iii. If the Chief General Manager so considers that the situation so warrants then he shall be entitled to terminate this agreement without giving any prior notice and also without assigning any reason in writing and the Contractor shall not be entitled to any compensation in the event of such termination.

iv. Vacation of Premises on Termination of agreement - On the expiry or earlier termination of this agreement the Contractor shall remove himself and his workmen from the premises and all articles belonging to him.

14. **Contractor's Liability and Insurance**

From commencement to completion of works, the Contractor shall take full responsibility for the care of the work and for taking precautions to prevent any loss or damage to the works and shall be liable for any damage or loss or theft that may arise to the works or any part thereof from any cause whatsoever, inherent defects and failures due to poor workmanship and causes such as lightning, explosion, earthquake, storm.

hurricane, floods, inundation, riots excluding civil war, rebellion, revolution and insurrection) and shall at his own cost repair and make good the same so that at all times the work shall be in good order and condition and in conformity in every respect with the requirements of the Contract.

Explanation:

a. For the purpose of this condition, the expression "from the commencement to completion of work" shall mean the time commencing from the issue of the work order to the contractor and ending with the issue of Virtual Completion Certificate.

b. Without limiting the obligations and responsibilities under this condition, the Contractor shall insure and keep insured the works from commencement to completion, as aforesaid

15. **No compensation on restrictions of work -**

The Bank shall be at liberty to abandon or reduce the scope of work of the contractor for the reasons whatsoever including unsatisfactory performance or inordinate delay in completing in the project. In such an eventuality, the contractor shall have no right to claim any payment/ compensation or otherwise whatsoever on account of any profit or advantage which he might have derived from the execution of the work fully but which he did not derive in consequence of the foreclosure of the whole or part of the work.

16. **Taxes and Duties**

i. The Contractor/ bidder shall be liable to pay all corporate taxes and income tax that shall be levied according to the laws and regulations applicable from time to time in India and the price quoted in the bid shall include all such taxes (excluding GST).

ii. All expenses, stamp duty and other charges/ expenses in connection with the execution of the Agreement as a result of this process shall be borne by the bidder.

17. **Patents, Rights and Loyalties**

The Contractor shall indemnify the Employer against all claims in respect of patent rights, design, trademarks of name or other protected rights in respect of any plant, machine work or material used for or in connection with the works or temporary works and from against all claims, demands, proceedings, damages, costs, charges and expenses whatsoever in respect thereof or in relation thereto. The Contractor shall defend all actions arising from such claims, unless he has informed the Bank's Engineer, before any such infringement and received their permission to proceed, and

shall himself pay all royalties, license fees, damages, costs and charges of all and every sort that may be legally incurred in respect thereof.

18. **Force Majeure**

a. Neither the contractor nor the Bank shall be considered in default in performance of their obligations if such performance is prevented or delayed by events such as war, hostilities revolution, riots, civil commotion, strikes, lockout, conflagrations, epidemics, accidents, fire, storms, floods, droughts, earthquakes or ordinances or any act of God or for any other cause beyond the reasonable control of the party affected or prevented or delayed. However, a notice is required to be given within 30 days from the happening of the event with complete details, to the other party to the contract, if it is not possible to serve a notice, within the shortest possible period without delay.

b. As soon as the cause of force majeure has been removed the party whose ability to perform its obligations has been affected, shall notify the other of such cessation and the actual delay incurred in such affected activity adducing necessary evidence in support thereof.

c. From the date of occurrence of a case of force majeure obligations of the party affected shall be suspended during the continuance of any inability so caused. With the cause itself and inability resulting there from having been removed, the agreed time of completion of the respective obligations under this contract shall stand extended by a period equal to the period of delay occasioned by such events.

d. Should one or both parties be prevented from fulfilling the contractual obligations by a state of force majeure lasting to a period of 6 months or more the two parties shall mutually decide regarding the future execution of this contract.

19. **Prevention of Sexual Harassment Clause**

The consultant shall comply to the provisions of Prevention of Sexual Harassment at workplaces Act.

a) The consultant shall be solely responsible for full compliance with the provisions of "the Sexual Harassment of women at workplace (Prevention, Prohibition and Redressal) Act, 2013". In case of any complaint of sexual harassment against its employee within the premises of the Bank, the complaint will be filed before the Internal Complaints Committee constituted by the consultants and shall ensure appropriate action under the said Act in respect to the complaint.

b) Any complaint of sexual harassment from any aggrieved employee of the consultant against any employee of the Bank shall be taken cognizance of by the Regional Complaints Committee constituted by the Bank.

c) The consultant shall be responsible for any monetary compensation that may need to be paid in case the incident involves the employees of the Project Architect, for instance any monetary relief to Bank's employee, if sexual violence by the employee of the consultant is proved.

d) The consultant shall be responsible for educating its employees about prevention of sexual harassment at workplace and related issues.

e) The consultant shall provide a complete and updated list of its employees who are deployed within the Bank's premises.

20. **Dismissal of workmen**

The Contractor shall on the request of the Bank's Officer immediately dismiss from the works any person Employed there-on who may, in the opinion of the NABARD, be unsuitable or incompetent or who may misconduct himself and such person shall not again be employed or allowed on the works without the permission of the Bank's Officer.

21. **Access to the works**

No person unless authorized by the Bank's Officer or the Employer, except the Representatives of Public Authorities, shall be allowed on the works at any time. If any work is to be done at place other than the site of the works, the Contractor shall obtain the written permission of the Bank's Officer for doing so.

22. **Assessment of works**

NABARD's Officer may from time to time intimate the Contractor that he requires the works to be assessed and inspected and the Contractor shall forthwith attend or send a qualified personnel to assist NABARD's Officer or their representative during inspection and to furnish all particulars or give all assistance required by either of them. The works shall be inspected according to the approved specifications for the works and QAP and issue necessary directions for rectification of defective works, if any observed. The Contractor or his Agent may take necessary steps to rectify the defects observed within a reasonable time.

23. **Material and Workmanship to conform to specifications**

All materials and workmanship shall, so far as procurable, be of the respective kinds specified in the as per the approved specifications, brands and in accordance with NABARD's instructions and the Contractor shall upon the request of NABARD's Officer furnish to them all invoices, accounts, receipts and other vouchers to prove that the materials comply therewith. The Contractor shall at his own cost arrange for and/or carry out any test of any materials which NABARD may require.

24. Contractor to provide everything necessary

The Contractor shall provide everything necessary for the proper execution of the works according to the true intent and meaning of the Drawings, Specifications and approved methodologies. The Contractors will supply, fix and maintain at his cost during the execution of any works, all the necessary centering, scaffolding, staging, timbering, strutting, shoring, pumping, fencing, hoarding, watching and lighting by night as well as by day required not only for the proper execution and protection of the public and safety of any adjacent roads, streets, cellars, vaults, pavements, walls, houses, buildings and all other erections, matters or things. The Contractor shall pull down and remove any or all such scaffolding, after completing his work as occasion shall require or when ordered to do so, and shall fully reinstate and make good all matters and things disturbed during the execution of the works, to the satisfaction of the Employer.

25. Removal of Defective materials/ works

NABARD shall, during the progress of the works, have power to order in writing from time to time the removal from the works, within such reasonable time as may be specified in the order, of any materials which, in the opinion of NABARD's Engineer are not in accordance with the specifications or the instructions of NABARD's Officer and the substitution of proper materials and the removal and proper re-execution of any such work, which has been executed with materials or workmanship, not in accordance with the Drawings and Specifications or instructions, and the Contractor shall forthwith carry out such order at his own cost. In case of default on the part of the Contractor to carry out such order the Employer shall have power to employ and pay other persons to carry out the same and all expenses consequent thereon or incidental thereto shall be borne by the Contractor, and shall be recoverable from him on behalf of the Employer or may be deducted by NABARD from any money due or that may become due to the Contractor. If the correcting works are not done in accordance with the contract, NABARD in consultation with the contractor may allow such work to remain and in that case may make allowance for the difference in value together with such further allowance for

damages to the Employer, as may be reasonable.

26. **Defects after completion**

Any defect appearing within the "Defects Liability Period" for a period of one year after the Virtual Completion of the work or latent/patent imperfections or defect becoming apparent during this period arising in the opinion of NABARD's Engineer from materials or workmanship not in accordance with the Contract, shall upon the directions and writing of NABARD's Engineer, and within such reasonable time as shall be specified therein, be amended and made good by the Contractor, at his cost and making good and in case of default the Employer may employ and pay other persons to amend and make good such defects, or faults, and all damages, loss and expenses consequent thereon or incidental thereto shall be made good and borne by the Contractor and such damage, loss and expenses shall be recoverable from him by NABARD or may be deducted by NABARD upon NABARD's Officer Certificate in writing from any moneys due or that may become due to the Contractor or the Employer (NABARD) may in lieu of such amending and making good by the Contractor, deduct from any money due to the Contractor a sum, to be determined by NABARD's Engineer, equivalent to the cost of amending such woks, and in the event the amount retained (Certificate and Payments) being insufficient, recover the balance from the Contractor. Further, contractor shall be execute performance warranty for a period of five years from the completion of defects liability period and any deficiencies observed in the performance of the waterproofing membrane due to any reasons to be attended by the contractor at his own cost and shall be done within a reasonable time on intimation of the same by the Bank's Engineer.

27. **Deviations/ Variations Extent and Pricing**

The contractor shall be paid nothing extra other than the lump sum amount quoted for the work as per the agreed methodology, specifications and as per the DPR to complete the work in all respects.

28. **Settlement of disputes/ Arbitration**

i. All disputes and differences of any kind whatsoever, arising out of or in connection with this Agreement or in the discharge of any obligation arising under this Agreement shall be resolved amicably disputes and differences of any kind whatsoever, arising out of or in connection with this Agreement or in the discharge of any obligation arising under this Agreement shall be resolved amicably.

ii. In case of failure to resolve the disputes and differences amicably within 30 days of the receipt of notice by the other party, then such unsettled dispute or difference shall be referred to arbitration by sole arbitrator mutually agreed in accordance with the Arbitration and Conciliation Act, 1996.

iii. If no agreement is arrived at within 30 days from the date of notice as to who shall be the sole arbitrator, NABARD shall send to the Contractor a list of three names of persons who shall be presently unconnected with NABARD. Contractor shall on receipt of the names as aforesaid, select any one of persons so named to be appointed as sole arbitrator and communicate his name to NABARD within 30 days of receipt of the names. NABARD shall thereupon without delay appoint the said person as the sole arbitrator.

iv. If Contractor fails to select the person as sole arbitrator within 30 days of receipt of the panel and inform NABARD accordingly, NABARD shall be entitled to appoint one of the persons from the panel as sole arbitrator and communicate his name to Contractor.

v. If the person so appointed is unable or unwilling to act or refuses his appointment or vacates his office due to any reason whatsoever, another person shall be appointed by NABARD from the above list of persons. The provisions of the Indian Arbitration and Conciliation Act, 1996, shall govern the arbitration.

vi. The venue of the arbitration shall be Mumbai under the exclusive jurisdiction of the courts at Mumbai only.

vii. Work under the Agreement shall be continued by Contractor during the arbitration proceedings unless otherwise directed in writing by NABARD. Save as those which are otherwise explicitly provided in the Agreement, no payment due, or payable by NABARD, to Contractor shall be withheld on account of the ongoing arbitration proceedings, if any, unless it is the subject matter, or one of the subject matters thereof.

29. **Assignment and Sub-letting**

The contractor shall not directly entrust and engage or indirectly transfer, assign or underlet the Project to any other person/ contractor. He shall not sublet any portion of the contract except with the written consent of the bank and no undertaking shall relieve them from the responsibility of active & superintendence of the work during its progress. In case of breach of these conditions, NABARD may serve a notice in writing on the Contractor rescinding the contract whereupon the security deposit shall stand forfeited to NABARD, without prejudice to other remedies against the Contract.

30. **Inspection of materials/ work at site**

i. NABARD at its discretion may inspect the material at site or elsewhere. However, all cost towards inspector's travelling, lodging, boarding if any would be borne by NABARD.

ii. NABARD's officials shall have free and full access at any time during execution of the contract to the contractor's works or site in case of the execution of work for the aforesaid purpose, and he may require to make arrangements for inspection of work or any part thereof or any material at the work site or at any other place as specified by NABARD's officials and if the contractor has been permitted to employ the service of a sub-contractor, reserve to NABARD's officials a similar right.

iii. The above will, however, not in any way absolve the contractor of his responsibility about proper performance of the system/ components.

iv. NABARD's officials carrying out the inspection shall have the power to certify/ accept/ reject as follows :

   a. Before any material or part thereof are submitted for inspection to certify that they or any portion thereof are not in accordance with the contract owing to adoption of any unsatisfactory method of manufacture.
   b. To reject any material or parts submitted as not being in accordance with the specification;
   c. To mark the rejected material with a rejection mark so that it may easily be identified if re-submitted.

Section 5: Additional Conditions of the contract

1. Bidders are advised to visit the site at their cost, conduct inspection of existing conditions to familiarize themselves with the site conditions, nature of works etc. and get all clarifications as necessary from NABARD during pre-bid meeting before quoting the rates.

2. Rates quoted by the bidder shall be deemed to include the following:

    i. Submission of test reports of other materials as may be specified by the Bank's Engineer. Necessary cost of taking samples of materials supplied by them for and testing of the same at Govt.'s / approved laboratory including transportation, cost of the samples, as and when required.

    ii. Rates should include all taxes, custom duty, excise duty, GST or any other taxes/duties imposed by /State Government/ Local Bodies/ Central Government, charges for labour, transport, insurance charges for transit, shipment, packing, freight from the factory to the destination site, handling, clearing, installation, and commissioning charges, insurance charges for storage, erection, testing and commissioning, CAR policy (1.25 times the Contract Value), workmen compensation and third party liability etc. and should be firm for the entire Contract period.

    iii. Charges for supplying and erecting suitable scaffolding made of bamboos / MS Pipes and stands with working platforms to his workers for carrying out the work hassle free, smoothly and safely and its removal after completion of the work.

    iv. Removal of debris out of work site to the safe limit earmarked in the premises daily basis, removal of debris out of the premises and dumping to Municipal Corporations dump yard periodically, removing stains, cleaning the site thoroughly and unless the same is done to the satisfaction of the NABARD's Engineer, the Bill will not be accepted.

    v. Providing suitable covers like tarpaulins, polythene sheets etc. to prevent dust nuisance and for protecting floors, furniture, costly equipment, other installations and parked vehicles in the influence area of his work in the premises. the rates quoted shall include all the above precautions and for handling and re-arranging the furniture etc. and place in its original position after completion of work and any damage to property caused by the Contractor shall be made good by the Contractor at his cost.

vi. Necessary arrangements for carrying out the work without causing disturbance to the working of the office and any inconvenience to the bank staff.

vii. Washing and cleaning the floors in the influence area of his activities at his cost after his daily completion of work.

viii. All tools, plants, workmen and consumables etc. as required for executing the work.

ix. Insurances required for carrying out the work.

3. The Lump sum amount quoted by the contractor to complete the project in all respects with 10 years performance warranty shall be as indicated in the tender and is firm throughout the contract period and extended period if any.

4. GST TDS and Income Tax TDS as applicable will be deducted from total payment due to the Contractor.

5. As far as possible, water and electricity shall be provided by the NABARD. In-case of non-availability, contractor may have to arrange the water & electricity on their own. The bank shall provide electricity and water at a single point and all the necessary arrangement for its distribution and safe usage shall be provided by the contractor.

6. On-site storage space will be provided to the Contractor subject to availability. However, the Contractor may erect temporary sheds for storage purposes at his cost with the permission of NABARD. NABARD will not be responsible for Contractor's materials. The Contractor may be required to vacate the storage space and sheds as per exigency after making good the area clean without any extra cost to NABARD.

7. The Contractor shall make necessary arrangement for watch and ward of his materials, tools, machines, scaffolding etc. stored for the execution of the work at his own risk and cost and NABARD will not be responsible on any account.

8. No advance shall be paid towards mobilisation and cost of materials.

9. Shelter or stay for the workmen must be arranged by the contractor outside NABARD office premises at his own expense and responsibility.

10. The Contractor should obtain approvals, if any, necessary for the work from the statutory bodies on behalf of NABARD. The fees and other statutory charges, if any, will be reimbursed to the Contractor based on the original receipts produced to NABARD.

11. Since the site is a Working office, the basement will be handed over zone-wise to the

contractor and has to execute the work in consultation with the bank's engineer. The contractor may also execute the work after working hours, nights and on holidays, if required. No extra payments will be made to the contractor on account of carrying out the works during holidays and at odd hours. For arranging the work on holidays and after office hours, the contractor has to obtain special written permission from NABARD in advance.

12. Further, demolition and cutting works where noise pollution and dust pollution is high may have to be carried out during restricted hours / Saturdays / Sundays / NABARD's holidays etc. with properly protecting the surroundings by covering the work site within hessian cloth enclosure and take related safety measure so that working of the office does not get affected.

13. The Contractor should not at any time do, cause or permit any nuisance on the site / do anything which shall cause unnecessary disturbances or inconvenience to the staff/visitors at site or near the site of work.

14. NABARD also reserves the right of supersession of any of the conditions, stipulated in the Tender Document.

15. The workmen employed by the Contractor should abide by the Rules and Regulations maintained by NABARD in the premises, especially in respect of working hours, entry of the workers to the premises, interpersonal relation with the occupants etc.

16. Any act of indiscipline / misconduct / theft / pilferage / careless activities on the part of any employee engaged by the Contractor resulting in any loss to NABARD in kind or cash will be viewed seriously and NABARD will have the right to claim damages or levy fine and / or terminate the Contract forthwith, if necessary.

17. The Contractor shall use necessary safety equipment and maintain all safety measures during the execution of works and ensure compliance of Safety Code as per Rules and Regulations in force.

18. The bidder shall assume full responsibility for the quality and specifications of items/ materials to be used in the work execution and shall be in accordance with the relevant NBC/ Indian Standards and other established codes.

19. The bidder should preferably interact closely with reputed Institutes with view to take relevant inputs for finalizing the suitable waterproofing and structural repairs execution methodology.

20. The Contractor shall engage necessary qualified and experienced supervisory staff at his

cost during the execution of the work for attending to day-to-day affairs. He shall visit the site regularly and keep record of daily work schedule. He shall also inform the progress to the Banks Engineer on daily basis and if necessary, meet NABARD's Engineer with prior appointment for any clarifications and to receive instructions, take measurements, etc. at the site.

21. The bidder shall coordinate with the bank and attend meetings with the bank as and when required during construction phase.

22. The contractor shall not be entitled to any compensation for any loss suffered by him on account of delays in commencing or executing the work, whatever the cause of delays may be, including delays arising out of modifications to the work entrusted to him or in any sub-contract connected therewith or delays in awarding contracts for other trades of the project or in commencement or completion of such works. NABARD does not accept liability for any sum besides the tender amount, subject to such variations as are provided for herein.

23. The bidder must co-operate with the other contractors appointed by NABARD so that the work shall proceed smoothly with the least possible delay. He should make his own arrangement for storage and protection of all materials supplied by him.

24. Not limiting to the scope of the work and the technical specifications provided in the Bid Document, the bidder has to ensure that he considers all the items required for completing comprehensive waterproofing and structural repair works of the Basement floors in NABARD Head Office building and to achieve desired results within the quoted price.

Section 6: General Safety Precautions to be followed

1. Appropriate precautions should be taken care of during the work.
2. The Contractor shall maintain in a readily accessible place first aid appliances including adequate supply of sterilized dressings and cotton wool.
3. An injured person shall be taken to a public hospital without loss of time, in cases where the injury necessitates hospitalization.
4. No portable single ladder shall be over 8 meters in length. The width between the side rails shall not be less than 30 cm. Clear and the distance between two adjacent rungs shall not be more than 30 cm. When a ladder is used, an extra workman shall be engaged for holding the ladder.
5. Care must be taken while unpacking. Band cutter should be used to cut all steel straps securing the package.
6. Every opening in the floor of a building or in a working platform be provided with suitable means to prevent the fall of persons or materials by providing suitable fencing or railing whose minimum height shall be one meter.
7. Workers employed on mixing and handling material shall be provided with protective footwear and rubber hand gloves.
8. Hoisting machine and tackle used in the works, including their attachments, anchorage and supports shall be in perfect condition.
9. The Employer reserves the right to instruct the Contractors to take additional safety precautions if found necessary.
10. All workers shall be provided with helmet, Safety Shoes and Safety belts.
11. All workers shall be provided kits in order to ensure the COVID-19 appropriate behavior in the premises.

Annexure I

Application Form

Date –

The Chief General Manager
Department of Premises, Procurement and Security
National Bank for Agriculture and Rural Development
Head Office
Plot C - 24, G Block,
BKC, Bandra East,
Mumbai – 400 051,

Sub: Request for Proposal for "Design, Engineering, Procurement and Execution of Waterproofing and related Structural Repair works of Basement Floors in NABARD Head Office Building at BKC, Bandra East, Mumbai – 51

Dear Sir,

1. Having examined the bid document relating to the works specified for subject matter, having visited and examined the site of the works specified in the said memorandum and having acquired the requisite information relating thereto as affecting the bid, I/We hereby offer to execute the services specified in the said memorandum within the time specified, at the rates mentioned in the Financial Bid in all respects of the bid and with such materials as are provided for, in accordance with such conditions in so far as they may be applicable.

2. **Memorandum:**

Subject	**Specification**
Description of work	Request for Proposal for "Design, Engineering, Procurement and Execution of Waterproofing and related Structural Repair works of Basement Floors in NABARD Head Office Building at BKC, Bandra East, Mumbai – 51
Location	NABARD Head Office, Mumbai- 400051
Earnest Money Deposit	Rs. 4,00,000/-
Time allowed for completion of the work	The time of completion for the total project shall be 8 months from the 14th date of issue of work order.
Liquidated Damages	Will be levied at 0.25% of the value of the accepted tender for every week of delay or part thereof by the contractor, subject

	to maximum of 5% of the value of the accepted tender for delay in completion of the work within the stipulated period.
Defect Liability Period	1 year from the date of virtual completion as certified by the Bank's Official.
Initial Security Deposit/ Performance Bank Guarantee	2% of the issued work order value, after the appropriation of the Earnest Money.
Retention Money Deposit (RMD)	Apart from ISD/ PBG, RMD @5% shall be deducted from each Running Account (RA) bills
Performance warranty for waterproofing works	RMD deducted at 5% of the total completed value of the work shall be retained by the bank till 10 years of performance warranty period from the certified completion of the project. No interest is payable.
Value of work for interim/ RA bills or Terms of Payment	Based on milestone completion as per the terms of the tender
Water & Electricity	As far as possible, water and electricity shall be provided by the NABARD. In-case of non-availability, contractor may have to arrange the water & electricity on their own.

3. My/our details are as under:

1. Name of the person / Institution:
2. Address:
3. Phone No:
4. Email-ID:

4. I/We understand that this is only a 'Request for proposal' and no contractual obligation on part of the Bank shall arise on the basis of this document. I have read and understood all the terms and conditions and I agree with the same. I hereby declare that the information furnished in the application is correct to the best of my / our knowledge and belief.

5. Should this tender be accepted, I/We hereby agree to abide by and fulfil the terms and provisions or the said Conditions of the tender annexed hereto in so far as they may be applicable or in default thereof to forfeit the EMD and pay to the National Bank for Agriculture and Rural Development, the amount mentioned in the said tender conditions.

.....

(Signature, name and address of the Applicant's executive duly authorized to sign on behalf of the Applicant)

For and on behalf of .....

(Name and address of the Applicant) (Seal of the Applicant)

Note: Certified copy of the Power of Attorney to be attached

Annexure II

Proforma of EMD credit details

Request for Proposal for "Design, Engineering, Procurement and Execution of Waterproofing and related Structural Repair works of Basement Floors in NABARD Head Office Building at BKC, Bandra East, Mumbai – 51.

(EMD details to be filled by bidders)

NAME OF THE ACCOUNT	NATIONAL BANK FOR AGRICULTURE AND RURAL DEVELOPMENT
BANK NAME	NABARD
BRANCH NAME	HEAD OFFICE, MUMBAI
IFSC CODE	NBRD0000002
ACCOUNT NUMBER (VAN)	NABADMN07

Name of the depositor	
Mode of transfer – Online (NEFT / RTGS)	
UTR No.	
Transaction date	
Amount deposited	
** ***Attach Bank Statement showing amount debited from account, on or before last date of submission of RFP.***	

Date:

Place: Signature with seal:

Annexure III

PRE-CONTRACT INTEGRITY PACT

(To be submitted On Rs. 200/- non-judicial stamp paper)

This pre-bid pre-contract Agreement (hereinafter called the Integrity Pact) is made on _____ day of the month of _____ between, on one hand, National Bank for Agriculture and Rural Development (NABARD), represented by Shri_____, CGM, Department of Premises, Security and Procurement, NABARD Head Office, Mumbai hereinafter called the "Employer", which expression shall mean and include, unless the context otherwise requires, his successors in office and assigns) of the First Part and M/s _____ represented by Shri _____, Chief Executive Officer (hereinafter called "Bidder" which expression shall man and include, unless the context otherwise requires, his successors and permitted assigns) of the Second Part.

WHEREAS the Employer proposes to carry out the work of "_____" and the Bidder is willing to offer/ has offered the quotes and

WHEREAS THE Bidder is a private company/ public company/ Government undertaking/ partnership/ registered export agency, constituted in accordance with the relevant law in the matter and the Employer is a body corporate established under NABARD Act, 1981 having its Head Office at Plot No. C-24, Block 'G', Bandra-Kurla Complex, Bandra (East), Mumbai and Andhra Pradesh Regional Office at Vijayawada.

NOW, THEREFORE,

To avoid all forms of corruption by following a system that is fair, transparent, and free from any influence/ prejudiced dealings prior to, during and subsequent to the currency of the contract to be entered into with a view to:

Enabling the Employer to obtain the desired said stores/ equipment at a competitive price in conformity with the defined specifications by avoiding the high cost and the distortionary impact of corruption on public procurement and

Enabling Bidders to abstain from bribing or indulging in any corrupt practice in order to secure the contract by providing assurance to them that their competitors will also abstain from bribing and other corrupt practices and the EMPLOYER will commit to prevent corruption, in any form, by its officials by following transparent procedures.

The parties hereto hereby agree to enter into this Integrity Pact and agree as follows:

Commitments of the Employer

1.1 The Employer undertakes that no official of the Employer, connected directly or indirectly with the contract, will demand, take a promise for or accept, directly or through intermediaries, any bribe, consideration, gift, reward, favour or any material or immaterial benefit of any other advantage form the BIDDER, either for themselves or for any person, organization or third party related to the contract in exchange for an advantage in the bidding process, bid evaluation, contracting or implementation process related to the contract.

1.2 The Employer will, during the pre-contract stage, treat all BIDDERs alike and will provide to all BIDDERs the same information and will not provide any such information to any particular BIDDER, which could afford an advantage to that particular BIDDER in comparison to other BIDDERs.

1.3 All the officials of the EMPLOYER will report to the appropriate Government office any attempted or completed breaches of the above commitments as well as any substantial suspicion of such a breach.

2. In case any such preceding misconduct on the part of such official(s) is reported by the BIDDER to the EMPLOYER with full and verifiable facts and the same is prima facie found to the correct by the EMPLOYER, necessary disciplinary proceedings, or any other action as deemed fit including criminal proceedings may be initiated by the EMPLOYER and such a person shall be debarred from further dealings related to the contract process. In such a case while an enquiry in being conducted by the EMPLOYER the proceedings under the contract would not be stalled.

3. Commitment of BIDDERs

3.1 The BIDDER commits itself to take all measures to prevent corrupt practices, unfair means and illegal activities during any stage of its bid or during a pre-contract or post-contract stage in order to secure the contract or in furtherance to secure it and in particular commit itself to the following: -

3.2 The BIDDER will not offer, directly or through intermediaries, any bribe, gift, consideration, reward, favor, any material immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the EMPLOYER, connected directly or indirectly with the bidding process, or to any person, organization or third party related to the contract in exchange for any advantage in the bidding, evaluation, contracting and implementation of the contract.

3.3 The BIDDER further undertakes that it has not given, offered or promised to give, directly or indirectly any bribe, gift, consideration, reward, favor, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the EMPLOYER or otherwise in procuring the Contract or forbearing to do or having done any act in relation to the obtaining or execution of the contract or any other contract with the Bank for showing or forbearing to show favor or disfavor to any person in relation to the contract or any other contract with the Bank.

3.4 BIDDERs shall disclose the name and address of agents and representatives and Indian BIDDERs shall disclose their foreign principles or associates.

3.5 BIDDERs shall disclose the payments to be made by them to agents/ brokers or any other intermediary, in connection with this bid/ contract.

3.6 The BIDDER further confirms and declares to the EMPLOYER that the BIDDER is the original manufacturer/ integrator/ authorized government sponsored export entity of the defence stores and has not engaged any individual or firm or company whether Indian or foreign to intercede, facilitate or in any way to recommend to the EMPLOYER or any of its functionaries, whether officially or unofficially to the award of the contract to the BIDDER, nor has any amount been paid, promised or intended to be paid to any such individual, firm or company in respect of any such intercession, facilitation or recommendation.

3.7 The BIDDER, either while presenting the bid or during pre-contract negotiations or before signing the contract, shall disclose any payments he has made, is committed to or intends to make to officials of the EMPLOYER or their family members, agents, brokers or any other intermediaries in connection with the contract and the details of services agreed upon for such payments.

3.8 The BIDDER will not collude with other parties interested in the contract to impair the transparency, fairness, and progress of the bidding process, bid evaluation, contracting and implementation of the contract.

3.9 The BIDDER will not accept any advantage in exchange for any corrupt practice, unfair means and illegal activities.

3.10 The BIDDER shall not use improperly for purposes of competition or personal gain or pass on to others, any information provided by the EMPLOYER as part of the business relationship regarding plans, technical proposals and business details, including information contained in any electronic data carrier. The BIDDER also undertakes to exercise due and adequate care lest any such information is divulged.

3.11 The BIDDER commits to refrain from giving any complaint directly or through any other manner without supporting it with full and verifiable facts.

3.12 The BIDDER shall not instigate or cause to instigate any third person to commit any of the actions mentioned above.

3.13 If the BIDDER or any employee of the BIDDER or any person acting on behalf of the BIDDER either directly or indirectly is a relative of any of the officers of the EMPLOYER, or alternatively if any relative of an officer of the EMPLOYER has financial interest/ stake in the BIDDER's firm, the same shall be disclosed by the BIDDER at the time of filling of tender.

The term 'relative' for this purpose would be as defined in Section 6 of the Companies Act 1986.

3.14 The BIDDER shall not lend to or borrow any money from or enter into any monetary dealings or transactions, directly or indirectly, with any employee of the EMPLOYER.

4. Previous Transgression

4.1 The BIDDER declares that no previous transgression occurred in the last three years immediately before signing of this Integrity Pact, with any other company in any country in respect of any corrupt practices envisaged hereunder or with any Public Sector Enterprises in India or any Government Department in India that could justify BIDDER's exclusion from the tender process.

4.2 The BIDDER agrees that if it makes incorrect statement on this subject, BIDDER can be disqualified from the RFP process or the contract, if already awarded, can be terminated for such reason.

5. Earnest Money Deposit (Security Deposit)

5.1 While submitting commercial bid, the BIDDER shall deposit an amount Rs. _____ as Earnest Money/ Security Deposit, with the EMPLOYER through online in favor of NABARD

5.2 The Earnest Money/ Security Deposit shall be valid up to a period of one year or the complete conclusion of the contractual obligations to the complete satisfaction of both the BIDDER and the EMPLOYER, including defect liability period, whichever is later.

5.3 In case of the successful BIDDER a clause would also be incorporated in the Article retaining to Performance Bond in the Purchase Contract that the provisions of Sanctions for Violation shall be applicable for forfeiture of Performance Bond in case of a decision by the EMPLOYER to

forfeit the same without assigning any reason for imposing sanction for violation of this Pact.

5.4 No interest shall be payable by the EMPLOYER to the BIDDER on Earnest Money/ Security Deposit for the period of its currency.

6. Sanctions for Violations

6.1 Any breach of the aforesaid provisions by the BIDDER or anyone employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER) shall entitle the EMPLOYER to take all or any one of the following actions, wherever required:

i. To immediately call off the pre-contract negotiations without assigning any reason or giving any compensation to the BIDDER. However, the proceedings with the other BIDDER(s) would continue.

ii. The Earnest Money Deposit (in pre-contract stage) and/ or Security Deposit/ Performance Bond (after the contract is signed) shall stand forfeited either fully or partially as decided by the EMPLOYER and the EMPLOYER shall not be required to assign any reason thereof.

iii. To immediately cancel the contract, if already signed, without giving any compensation to the BIDDER.

iv. To recover all sums already paid by the EMPLOYER, and in case of an Indian BIDDER with interest thereon at 2% higher than the prevailing Prime Lending Rate of State Bank of India, while in case of a BIDDER from a country other than India with interest thereon at 2%, higher than the LIBOR. If any outstanding payment is due to the BIDDER from the EMPLOYER in connection with another contract for any other stores, such outstanding payment could also be utilized to recover the aforesaid sum and interest.

v. To encash the advance bank guarantee and performance bond/ warranty bond, if furnished by the BIDDER, in order to recover the payments, already made by the EMPLOYER, along with interest.

vi. To cancel all or any other contracts with BIDDER. The BIDDER shall be liable to pay compensation for any loss or damage to the EMPLOYER resulting from such cancellation/ rescission and the EMPLOYER shall be entitled to deduct the amount so payable from the money(s) due to the BIDDER.

vii. To debar the BIDDER from participating in future bidding processes of the Government of India for a minimum period of five years, which may be further extended at the

discretion of the EMPLOYER.

viii. To recover all sums paid in violation of this Pact by BIDDER(S) to any middleman or agent or broker with a view to securing the contract.

ix. In cases where irrevocable Letters of Credit have been received in respect of any contract signed by the EMPLOYER with the BIDDER, the same shall not be opened.

x. Forfeiture of Performance Bond in case of a decision by the EMPLOYER to forfeit the same without assigning any reason for imposing sanction for violation of this Pact.

6.2 The EMPLOYER will be entitled to take all or any of the actions mentioned at para 6.1(i) to (x) of this Pact also on the Commission by the BIDDER or any one employed by it or acting on its behalf (whether with our without the knowledge of the BIDDER), of an offence as defined in Chapter IX of the Indian Penal code, 1860 or Prevention of Corruption Act, 1988 or any other statute enacted for prevention of corruption.

6.3 The decision of the EMPLOYER to the effect that a breach of the provisions of the Pact has been committed by the BIDDER shall be final and conclusive on the BIDDER. However, the BIDDER can approach the Independent Monitor(s) appointed for the purposes of this Pact.

7. Fall Clause

7.1 The BIDDER undertakes that it has not supplied/s not supplying similar product/ systems or subsystems at a price lower than that offered in the present bid in respect of any other Ministry/ Department of the Government of India or PSU and it is found at any stage that similar product/ systems or sub systems was supplied by the BIDDER to any other Ministry/ Department of the Government of India or a PSU at a lower price, then that very price, with due allowance for elapsed time, will be applicable to the present case and the difference in the cost would be refunded by the BIDDER to the EMPLOYER, if the contract has already been concluded.

8. Independent Monitors

8.1 The EMPLOYER has appointed Independent Monitor Shri Jagdeep Kumar Ghai [P&TA, FS (Retd)] (hereinafter referred to as Monitor) for this Pact in consultation with the Central Vigilance Commission.

8.2 The task of the Monitor shall be to review independently and objectively, whether and to what extent the parties comply with the obligations under this Pact.

8.3 The Monitor shall not be subject to instructions by the representatives of the parties and

perform their functions neutrally and independently.

8.4 Both the parties accept that the Monitors have the right to access all the documents relating to the project/ procurement, including minutes of meetings.

8.5 As soon as the Monitor notices or has reason to believe, a violation of this Pact, he will so inform the Authority designated by the EMPLOYER.

8.6 The BIDDER(s) accepts that the Monitor has the right to access without restriction to all Project documentation of the EMPLOYER including that provided by the BIDDER. The BIDDER will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to Subcontractors. The Monitor shall be under contractual obligation to treat the information and documents of the BIDDER/ Subcontractor(s) with confidentiality.

8.7 The EMPLOYER will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the parties. The parties will offer to the Monitor the option to participate in such meetings.

8.8 The Monitor will submit a written report to the designated Authority of EMPLOYER within 8 to 10 weeks from the date of reference or intimation to him by the EMPLOYER/ BIDDER and should the occasion arise submit proposals for correcting problematic situations.

9. Facilitation of Investigation

In case of any allegation of violation of any provisions of this Pact or payment of commission, the EMPLOYER or its agencies shall be entitled to examine all the documents including the Books of Accounts of the BIDDER and the BIDDER shall provide necessary information and documents in English and shall extend all possible help for the purpose of such examination.

10. Law and Place of Jurisdiction

This Pact is subject to Indian Law. The place of performance and jurisdiction is the seat of the EMPLOYER.

11. Other Legal Actions

The actions stipulated in this Integrity Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the extant law in force relating to any civil or criminal proceedings.

12. Validity

12.1 The validity of this Integrity Pact shall be from date of its signing and extend up to 5 years or the complete execution of the contract to the satisfaction of both the EMPLOYER and the BIDDER/ Seller, including warranty period, whichever is later in case BIDDER is unsuccessful, this Integrity Pact shall expire after six months from the date of the signing of the contract.

12.2 Should one or several provisions of this Pact turn out to be invalid, the remainder of this Pact shall remain valid. In this case, the parties will strive to come to an agreement to their original intentions.

13. The parties hereby sign this Integrity Pact at _____ on _____.

EMPLOYER	BIDDER
Name of the Officer	Chief Executive Officer
Designation	
NABARD	
Witness	Witness
1.	1.
2.	2.

Annexure IV

General Information of the Bidder

S. No	Particulars	Details	
1	Name of the Firm		
2	Registered Address		
3	Telephone		
4	E-mail id		
5	Legal Status of the Applicant / Type of the organization: (Whether Partnership Firm / Private Limited company/ Public Limited Company / Co-operative Body)		
6	Date of Establishment of the firm		
7	GST Registration Number		
8	Turnover of the firm during the last 3 years	Year Ended on	Turnover in Lakhs
		31.03.2022	
		31.03.2023	
		31.03.2024	
9	Name of Proprietor/ Partners/ Directors		
10	Number of years of Experience in executing similar works		
11	Number of similar projects carried out and successfully completed during the last 10 years		
12	Names of Bankers and their full address (Solvency certificate from the Bank shall be submitted separately by the Banker/s)		
13	Whether registered as a contractor to any Govt. / CPWD? Mention the registration number and year of registration.	Attach Documentary Proof	
14	Whether any Civil Suit/ Litigation arisen in the contracts executed/ being executed during the last 5 years. If yes, please furnish the name of the project, organization, nature of work, contract value, work order, date and brief details of litigation.		

18	Name and Communication details of firm representative in respect of the bid application	
19	Address of the Office through which the proposed work of the bank will be handled and Name and Designation of the Office-In-Charge	

.....

(Signature, name and address of the Applicant's executive duly authorized to sign on behalf of the Applicant)

For and on behalf of .....

(Name and address of the Applicant) (Seal of the Applicant)

ANNEXURE-V

Organizational Setup and List of professional staff (Engineers-Civil, Structural having experience in civil, structural and waterproofing works) with the firm, giving their qualification, experience, including that in the present organization*

Sr. No.	Name	Age	Qualification	Experience	Nature of works handled	Name of the assignments handled	Date from which employed in the present organization
1	2	3	4	5	6	7	8

*** Use separate/additional sheets as per the requirement**

……..

(Signature, name and address of the Applicant's executive duly authorized to sign on behalf of the Applicant)

For and on behalf of ……..

(Name and address of the Applicant) (Seal of the Applicant)

Note: Indicate other points (including clients' certificates), if any, relating to your technical and managerial competency which you would like to bring to our notice.

Annexure VI

Financial Information of Applicant

Name of the Bidder/ firm:

S.No	Particulars	FY 2021-22 (Rs in Lakhs)	FY 2022-23 (Rs in Lakhs)	FY 2023-24 (Rs in Lakhs)
1	Total Assets			
2	Current Assets			
3	Total Liabilities			
4	Current Liabilities			
5	Profit Before Taxes			
6	Profit After Taxes			
7	Net Worth (1- 3)			
8	Annual Turnover			

*FY – Financial Year beginning of April to March Certification

.....

(Signature, name, address and membership ID of the Chartered Accountant with Seal)

(UDIN of the document provided by the Chartered Accountant)

.....

(Signature, name and address of the Applicant's executive duly authorized to sign on behalf of the Applicant)

For and on behalf of .....

(Name and address of the Applicant) (Seal of the Applicant)

Note: Kindly enclose audited balance sheets and profit & loss statements in support of the above-mentioned data. Kindly highlight the relevant portion of the balance sheet. Also enclose copies of Income Tax Returns filed by the entity during the above-mentioned periods.

Annexure VII

Non-Blacklisting Declaration

(To be submitted in Company's letter head)

Date –

The Chief General Manager
Department of Premises, Security and Procurement,
National Bank for Agriculture and Rural Development,
Head Office
Plot No. C-24, G Block,
BKC, Bandra East,
Mumbai – 400 051

Sub: Declaration for non-blacklisting for engagement of contractor for Design, Engineering, Procurement and Execution of Waterproofing and related Structural Repair works of Basement Floors in NABARD Head Office Building at BKC, Bandra East, Mumbai – 51

Dear Sir,

I/ We hereby declare that we are not blacklisted by any Central/ State Government/ agency of Central/ State Government of India or any other country in the world/ Public Sector Undertaking/ any Regulatory Authorities in India or any other country in the world for any kind of fraudulent activities.

.....

(Signature, name and address of the Applicant's executive duly authorized to sign on behalf of the Applicant)

For and on behalf of .....

(Name and address of the Applicant) (Seal of the Applicant)

Annexure VIII

Details of Important works/ contracts executed by the contractor during the last 7 years

(Duly supported by Work Orders and Completion certificate from the client)

Sr. No	Name and location of the work	Employer's name and address	Agreement No. & Date of Start of the work	Nature of the work involved in the contract	Value of the project	Stipulated completion of the project	Actual Completion of the project	Whether the work was left incomplete/ terminated from either side/ litigation/ arbitration, if any (Give full details along with the reasons if not completed)
1	2	3	4	5	7	8	9	10

Note: - The applicants are required to enclose / attach a copy each of the Letter of Award of work and completion certificates issued by Clients in respect of each and every project being listed by them in this form.

.....

(Signature, name and address of the Applicant's executive duly authorized to sign on behalf of the Applicant)

For and on behalf of .....

(Name and address of the Applicant) (Seal of the Applicant)

Annexure IX

Details of important works/ contracts on hand being executed by the contractor

(Duly supported by Work Orders)

Sr. No	Name and location of the work	Employer's name and address	Agreement No. & Date of Start of the work	Value of the work	Duration of the work		Expected Completion in year
1	2	3	4	5	6	7	8
					From	To	

Note: - The applicants are required to enclose / attach a copy each of the Letter of Award of work in respect of each and every project being listed by them in this form.

.....

(Signature, name and address of the Applicant's executive duly authorized to sign on behalf of the Applicant)

For and on behalf of .....

(Name and address of the Applicant) (Seal of the Applicant)

Annexure X

Declarations

The Applicant declares / undertakes that:

1. The signatory is competent and legally authorized to submit the tender and / or to enter into legally binding contract.

2. The Applicant is not in the list of blacklisted /debarred firms of any Government Agency anywhere in the world, for participating in the EOI, under that country's laws or official regulations.

3. The Applicant accepts all the terms and conditions of this bid document and abides by it without any counter conditions.

4. The information given in the bid documents is correct and the Applicant is aware that if any information provided is found to be false at a later stage, the Bank reserves the right to reject / disqualify the Applicant at any stage without assigning any reason.

5. No agents are engaged or proposed to be engaged for participation in this bid.

6. The operation of the Applicant in Pakistan or China, if any, would be suitably firewalled from the contract / operations with Government of India. No employee who has previously worked or been posted in Pakistan or China in any capacity shall be engaged by the Applicant for this project and that no Pakistan national or person of Pakistan Origin shall be engaged by the Applicant for the project.

.....

(Signature, name and address of the Applicant's executive duly authorized to sign on behalf of the Applicant)

For and on behalf of .....

(Name and address of the Applicant) (Seal of the Applicant)

Annexure XI

Pro-forma for furnishing the payment details of the bidder.

Name of the Bidder		
Contact Details	Name	
	Email	
	Phone No	
PAN details (enclose copy of PAN)		
GST Number (enclose copy of GST registration)		
Address of principle place of business in the state as per GST registration certificate	Address	
	City	
	PIN	
	State	
Bank account number		
Account Name		
Type of the account		
Name & Address of Bank		
IFSC Code **(enclose copy of cancelled cheque)**		

Name of the Consultant:

Date:

Place: Signature with seal:

Annexure XII

INDEMNITY BOND

(on Rs.200 non-judicial stamp paper)

Know all men by these presents that I, Shri.....of M/s ..... do hereby execute Indemnity Bond in favour of National Bank for Agriculture and Rural Development (NABARD), having their Registered Office at C-24, G Block, Bandra-KurIa Complex, Bandra(E) Mumbai-400051 and M/s ..... having their registered office at ....., Mumbai – 400051 ..... on this ..... day of ..... 2023.

Whereas NABARD have appointed M/s ..... as the Contractor for their proposed work relating to "_____".

THIS DEED WITNESSETH AS FOLLOWS: -

I/We, on behalf of M/s ..... hereby do indemnify *to keep NABARD and its Employees harmless* against and from

any third party claims, civil or criminal complaints liabilities, site mishaps and other accidents or disputes and/or damages occurring or arising out of any mishaps at the site due to faulty work, for our negligence, faulty construction and/or for violating any law, rules and regulations in force, for the time being while executing/executed works by me/us,

any damages, loss or expenses due to or resulting from negligence or breach of duty on the part of me/us or any *of our* sub-contractor/s if any, servants or agents.

any claim by an employee of mine/ours or of sub-contractor/s, if any, under the Workmen Compensation Act and Employers Liability Act, 1939 or any other law, rules and regulations in force for the time being and any Acts replacing and/or amend the same or any of the same as may be in force at the time and under any law in respect of injuries to persons or property arising out of and in the course of the execution of the contract work and/or arising out of and in the course of employment of any workmen/employee.

any act or omission of mine/ours of sub-contractor/s if any, our/their servants or agents which may involve any loss, damage, liability, civil or criminal action.

any claims in respect of patent rights, design, trademarks of name or other protected rights in respect of any plant, machine work or material used for or in connection with the works

or temporary works and from against all claims, demands, proceedings, damages, costs, charges and expenses whatsoever in respect thereof or in relation thereto and shall pay any royalties, license fees, damages, costs and charges of all and every sort that may be legally incurred in respect thereof.

IN WITNESS WHEREOF M/s ..... has set their hands on this .....day of .....

SIGNED AND DELIVERED BY THE AFORESAID M/s ..... through their authorized representative (Shri .....).

Signature

IN THE PRESENCE OF WITNESSES:

1. Name & Signature :

2. Name & Signature:

Annexure XIII

ARTICLES OF AGREEMENT

(on Rs.200 non-judicial stamp paper)

ARTICLES OF AGREEMENT made this _____ day of _____ between the National Bank for Agriculture and Rural Development (NABARD) (hereinafter called "the Employer") and having its Head Office at Plot C-24, G Block, Bandra Kurla Complex, Bandra East, Mumbai – 400 051 of the one part and M/s ---------- -- (herein after called "the Consultant") having its office at ---------- ---------- of the other part.

WHEREAS the Employer is desirous of getting executed the work of "Design, Engineering, Procurement and Execution of Waterproofing and related Structural Repair works of Basement Floors in NABARD Head Office Building at BKC, Bandra East, Mumbai – 51" and has caused the technical and price bids showing and describing the work to be done under the direction of the Employer.

AND WHEREAS the said technical bid and the Price Bid have been signed by or on behalf of the parties hereto.

AND WHEREAS the Tenderer has agreed to execute upon and subject to the scope of works and conditions set forth in the *technical &* Price Bids and Conditions of Contract (all of which are collectively hereinafter referred to as "the said Conditions") the work shown upon the said technical specifications, and included in the Price Bid at the respective rates therein set forth amounting the sum as therein arrived or such other sum as shall become payable there under (hereinafter referred to as "the said contract amount").

NOW IT IS HEREBY AGREED AS FOLLOWS: -

1. In consideration hereinafter mentioned, the Tenderer will upon and subject to the conditions annexed, carry out and complete the works shown in the contract, described by or referred to in the scope of the works as per the agreed methodology and specifications and in the said conditions.

2. The Employer shall pay the Tenderer the said contract amount or such sum as shall become payable at the times and in the manner specified in the said conditions.

3. The said Conditions and Appendix thereto and the documents attached hereto shall be read and construed as forming part of this Agreement and the parties hereto shall be respectively abide by, submit themselves to the said Conditions and the correspondence and perform the

agreement on their part respectively in the said conditions and the documents contained herein.

4. This Agreement and documents mentioned herein shall form the basis of this contract.

5. This contract is an item rate contract for carrying out the work of **"Design, Engineering, Procurement and Execution of Waterproofing and related Structural Repair works of Basement Floors in NABARD Head Office Building at BKC, Bandra East, Mumbai – 51**" and to be paid for according to actual measured quantities at the rates contained in the Schedule of Rates and probable quantities or as provided in the said conditions.

6. The Tenderer shall afford every reasonable facility for the works of all the other Contractors, who are engaged by the Employer and shall make good any damage done by them or their people to any of the Employer's property after the completion of such works.

7. The Employer reserves to itself the right of altering the nature of work by adding to or omitting any items of work or having portions of the same carried out by engaging any other contractor / agency at its sole discretion without prejudice to this contract. The contractor shall not have any right to claim loss of profit / loss of opportunity to work from the Employer.

8. The tenderer shall have to submit the "no other claims certificate" along-with the final bill and once the final bill is settled by the Employer, the tenderer will not have any right to claim for either any tender related or non-related work.

9. Time shall be considered as the essence of this contract, and the Tenderer hereby agrees to complete the entire work within **8 months** as prescribed in the tender, which shall be reckoned from 14th day of the date of issue of work order subject nevertheless to the provision for extension of time as permissible by the Employer.

10. All disputes arising out of or in any way connected with this agreement shall be deemed to have arisen at Mumbai and only the sole Arbitrator as appointed by both the parties upon mutual consent in Mumbai shall have the jurisdiction to determine the same.

11. That the all parts of this contract have been read and fully understood by the tenderer.

IN WITNESS WHEREOF the Employer has set its hands to these presents through its duly authorized officials and the Tenderer has caused its common seal to be affixed hereunto and the said two duplicates/ has caused these presents and the said two duplicates here of to be executed on its behalf, the day and year first herein above written.

Signature Clause

SIGNED AND DELIVERED by the National Bank for Agriculture and Rural Development by the hand of Shri	SIGNED AND DELIVERED by the Bidder
(Name & Designation)	(Name & Designation)
In the presence of:	
1. Witness #1	
Signature:	Signature:
Name:	Name:
Address	Address
2. Witness #2	
Signature:	Signature:
Name:	Name:
Address	Address

Annexure XIV

UNDERTAKING FOR PERFORMANCE WARRANTY

(on Rs.200 non-judicial stamp paper)

PERFORMANCE UNDERTAKING FROM THE CONTRACTOR

National Bank for Agriculture and Rural Development,
Plot No. C-24, 'G' Block,
Bandra - Kurla Complex,
Bandra (East), MUMBAI - 400 051

WHEREAS

1. National Bank for Agriculture and Rural Development (NABARD) is desirous of performing waterproofing of basement floors in NABARD, Head Office, BKC, Bandra (E), Mumbai-51 (hereinafter referred to as "the said Buildings") along with the structural repairs of the basement and for that purpose invited "Request for Proposal for Design, Engineering, Procurement and Execution of Waterproofing and related Structural Repair works of Basement floors in NABARD Head Office Building at BKC, Bandra East, Mumbai – 51".

2. Pursuant to the acceptance by NABARD of the tender dated …… submitted by us i.e. ……. NABARD has issued Work Order bearing …….. dated ……. (Hereinafter referred to as "the said order")

3. It is one of the terms of the of the said order that works of "Design, Engineering, Procurement and Execution of Waterproofing and related Structural Repair works of Basement floors in NABARD Head Office Building at BKC, Bandra East, Mumbai – 51" shall be carried out as per the scope of the works and approved waterproofing and structural repairs methodology as per the specifications to protect the structure from seepage and water leakage issues.

4. It is also one of terms of the said order that we shall furnish to NABARD a performance undertaking against any defect which may arise in a period of ten years from the date of virtual completion pertaining to both the materials and workmanship in respect of the water proofing and structural repairs of basement floors in NABARD Head office building and which performance undertaking shall be signed by M/s …….. and which shall be valid for duration of ten years from the date of virtual completion of the said Work.

NOW, THEREFORE, THIS PERFORMANCE UNDERTAKING WITNESSETH THAT:

1. We have carried out the said waterproofing Work along with the related structural repair works. We have read and understood the specifications, terms and conditions of the said work

as provided in the said order.

2. After Virtual Completion of the said Work and before the completion of the ….. day of ……., if at any time or times, any defects such as physical damage of any elements of the said waterproofing or structural repair work due to weathering action or due to failure of the components or due to inferior quality of material/workmanship and any water seepage/ leakage either due to inadequacy of the work carried out or due to any other reason, whatsoever relating to the specifications, workmanship, etc., we hereby undertake to carry out necessary remedial measures up to ten years from the date of virtual completion of the said work to such extents so and often as may be necessary to free the premises from such leakages/dampness without any extra cost to the NABARD. The decision of the NABARD in regard to the question as to whether there is any leakage or the treatment has given way to water or moisture shall be treated as final and binding on us. We shall diligently, efficiently and satisfactorily rectify the defects or faults detected/arising, during the aforesaid period to the full satisfaction of NABARD and also undertake to attend to the rectification work and reinstate the surfaces disturbed to its original condition after carrying out the rectification work, if necessary, by arising new materials at no extra cost to NABARD.

3. We shall not revoke it without written consent of NABARD.

Signed by: …….

For and on behalf of M/s ……

Date :

Place :

Appendix I

IIT Bombay Report on Basement Condition and Repair Methodology

INDIAN INSTITUTE OF TECHNOLOGY BOMBAY
Department of Civil Engineering
Powai, Mumbai - 400 076 (India)
Phone: (+91-22) - 2576 7323/5325
Fax: (+91-22) - 2572 3480, 2576 7302
Email: prakashn@.iitb.ac.in
venkatad@iitb.ac.in

Dr. Prakash Nanthagopalan
Dr. Venkata Santosh Kumar Delhi

11-03-2019

To

The Chief General Manager

National Bank for Agriculture and Rural Development (NABARD),

Plot C -24, G Block, BKC, Bandra (E), Mumbai – 400051.

Dear Sir

Sub: Basement waterproofing of NABARD, Head Office Building, Mumbai

Ref: NB. DPSP/2253/HO 28- Consultancy/2018-19 dated 25. 10. 2018

Ref: Job: No. DRD/CE/PN-1/18-19 (Letter from IIT Bombay dated (01-02-2019))

Based on the reference cited above, we made a site visit to NABARD-Head office building at Bandra Kurla Complex, Mumbai on 13th November 2018 to assess the extent of dampness/seepage in basement through visual inspection. Mr. Ajith Kumar Pittan (from NABARD) was with us during the visit. During the site visit, the current conditions of the basement slab, wall and floor due to the water seepage were noted. Further, possible reasons for the seepage problems were identified. Based on our visit, a report is submitted as follows

1. Current condition of basement due to water dampness/seepage.
2. Possible reasons for dampness/seepage on structural elements (Source of water).
3. Systematic methodology for assessment of the weak zones/leakage zones along with suitable repair strategy

The report is given in the annexure.

Thanks and Regards

11/03/2019

Dr. Prakash Nanthagopalan

डॉ.प्रकाश नंथगोपालन
Dr. Prakash Nanthagopalan
सहायक प्राध्यापक-Assistant Professor
सिविल अभियांत्रिकी विभाग/Dept. of Civil Engineering
भारतीय प्रौद्योगिकी संस्थान मुंबई
Indian Institute of Technology Bombay
पवई/Powai मुंबई/Mumbai- 400 076 INDIA

11/03/2019

Dr. Venkata Santosh Kumar Delhi

डॉ.वेंकट संतोष कुमार दिल्ली
Dr. Venkata Santosh Kumar Delhi
सहायक प्राध्यापक-Assistant Professor
सिविल अभियांत्रिकी विभाग/Dept. of Civil Engg.
भारतीय प्रौद्योगिकी संस्थान मुंबई
Indian Institute of Technology Bombay
पवई/Powai मुंबई/Mumbai- 400 076 INDIA

Annexure

Site visit report based on visual inspection of basement

Building: **NABARD Head office Building**

Current condition Basement (level 2):

Fig. 1 Presence of water just below the tile at the basement

Fig. 2 Water oozing out from the gap between the floor tiles

From Fig. 1 & 2, it is very clear that, the water is available at the floor level. This makes the water to rise up easily through the weak zones i.e the gap between the tiles to the floor. Further, the walls and slabs (Fig. 3) of the basement (level 2) were observed with dampness stains, with plaster or paint peeled off from the wall.

Fig. 3 Dry stains of dampness

Current condition Basement (level 1):

Continuous water seepage from the corner of a wall in one portion of the basement level was observed (from Fig. 4).

Fig. 4 Continuous water seepage from the wall

Fig. 5 Water seepage at wall and beam column junction.

Further, mild water seepage was observed at the corner of the wall junction and the beam column joint junction (Fig. 5).

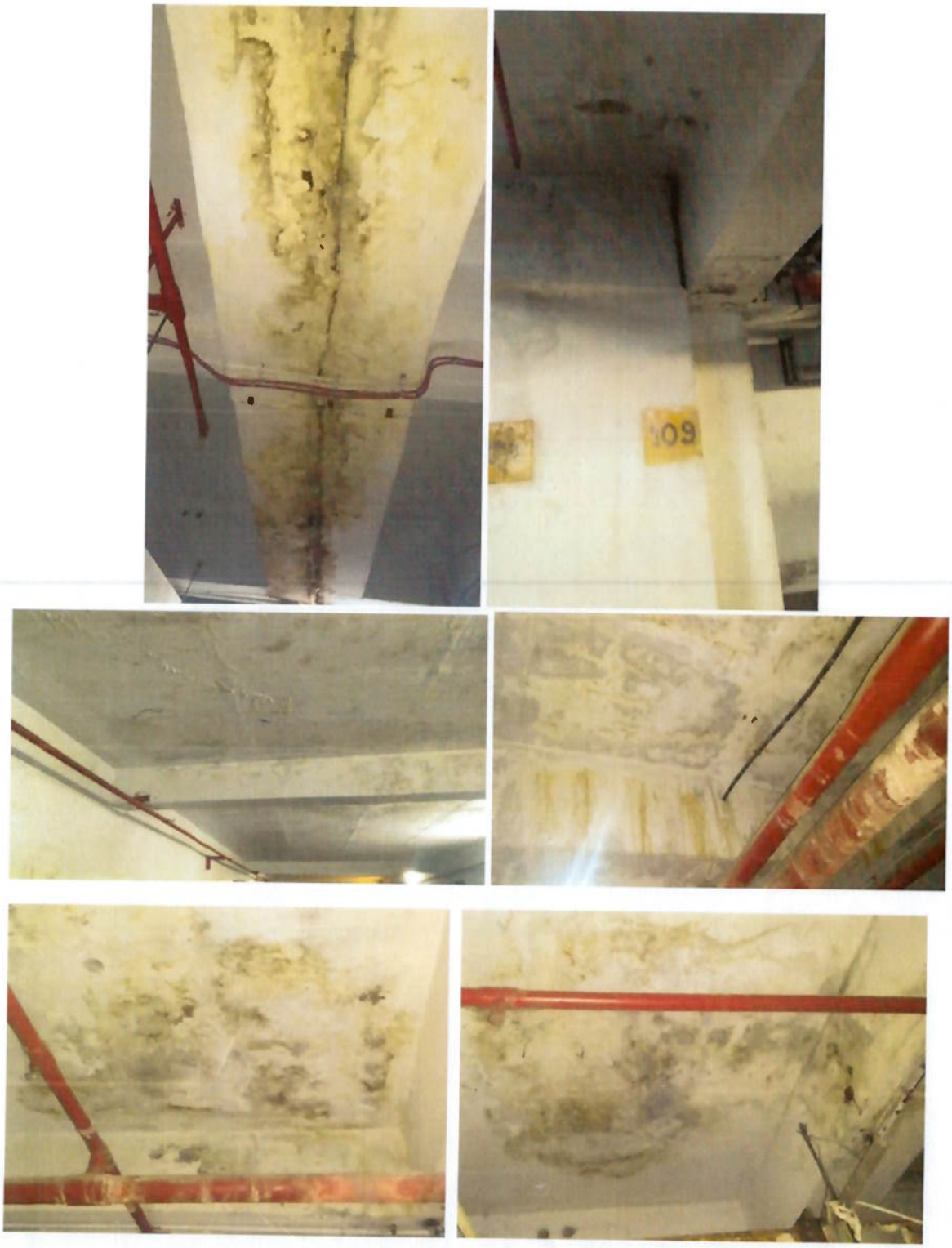


Fig. 6 Stains of water dampness/seepage on slabs and beams soffit

At many locations of basement (level 1), stains of water dampness were observed on soffits of slabs and beams (Fig. 6). Due to this water seepage/dampness, plaster peeled off (Fig. 7) and the reinforcement bars are corroded (Fig. 8) at many locations of basement.

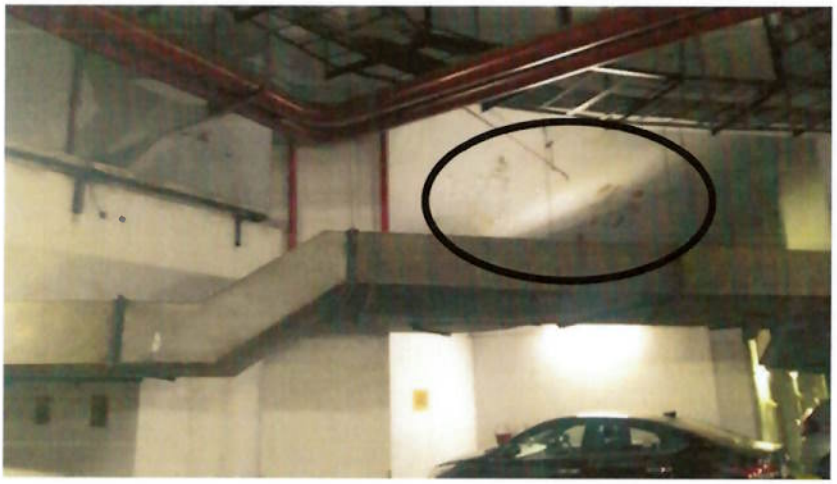


Fig. 7 Plaster peeling below the ramp (stairs)

Fig. 8 Exposed corroded rods in beams

2. Possible reasons for dampness/seepage on structural elements:

It is very evident that, the water table is almost at the level of the basement (level 2) floor. This will further increase during monsoon and may lead to flooding of the floor. The prolonged moisture in the soil or improper water drains adjacent to the wall may also cause dampness. This may reach the level of continuous seepage in case of the continuous supply of water through permeable medium of soil/concrete. In certain locations, the dried stains of dampness seems to indicate that, the issue is intermittent, which may pop out mainly during monsoon. The alternate dryness and dampness of the structural elements is not be desirable on durability note. The existing garden (Fig. 9) is dwelling on 60 cm soil above the top slab of the basement (level 1). In addition to monsoon, the continuous wetness of the soil will be a source of water. Further, the mild water seepage from fire hydrant (Fig. 10) may also be a source of moisture. Depending on the nature of the concrete slab, the water or moisture will penetrate in to the concrete slab causing dampness/seepage.

Fig. 9 Garden area above the basement

Fig. 10 Fire hydrant

At some locations around the building (Fig. 11 & 12), either the manholes (access point) covers are damaged or kept opened. These may allow the rainwater along with dry leaves or other contaminants to seep through and block the drains, in turn make the place to be source of water stagnation. This source of water may cause dampness on slabs/beams.

Fig. 11 Damaged Manhole covers

Fig. 12 Improperly closed drains

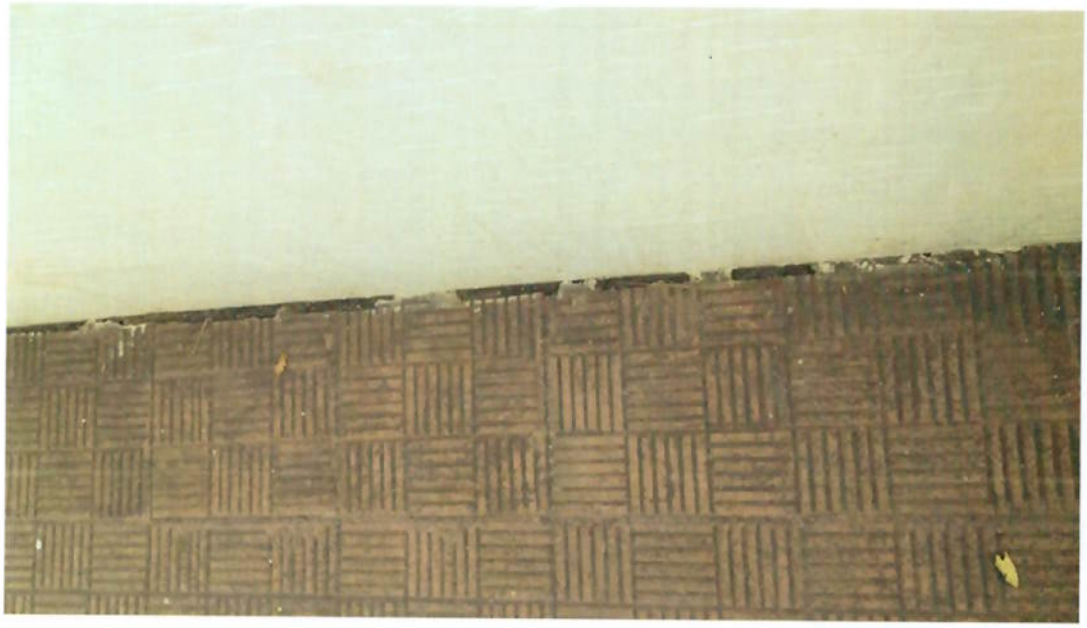


Fig. 13 Gaps between the paver tiles and the wall on the ramp toward the car parking

At the junction of wall and the tiles (on the ramp) towards the parking (Basement), the gap (Fig. 13) will allow the water to percolate, in turn may lead to dampness in the slabs beneath.

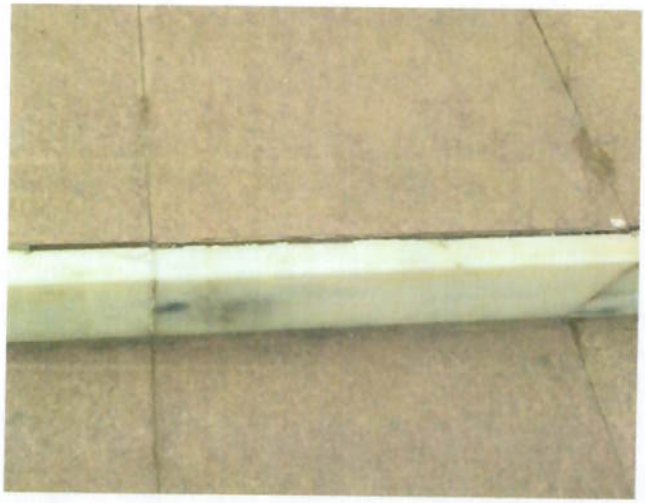
Fig. 14 Drains filled with dry leaves

The water drains were seen with lot of mud and dry leaves (Fig. 14), may lead to improper flow of water or sometimes may result in water stagnation. This may cause dampness on slabs.

It was observed that (Fig. 15), the joints with sealants/binders of the stone tiles on the stairs are damaged. This may allow the water to percolate through the stairs leading to dampness on the soffit of the ramp.

(a)

(b)



(c)

(d)

Fig. 15 Gap in between the stone tiles (circled) on the steps

3. Systematic methodology for assessment of the weak zones/leakage zones along with suitable repair strategy.

Based on the observation of the dampness/extent of seepage on structural elements of basement (level 1 and 2) and possible reasons, the following methodology is recommended to be followed to get detailed assessment of the weak zones/permeable zones.

A. Identification and quantification of all the defects and its locations.
B. Non Destructive Techniques for precise assessment of defects.
C. Suggested repair methodology.

A. Identification and quantification of all the defects and its locations

Assessment of all the structural members (basement area) by marking the observed defects on the plan and noting its extent (in terms of measurement). The entire side walls would be assessed conducted by tapping with appropriate hammer in order to record the defects like loose patches of plasters, honey combing etc. This would also help in identifying the severely distressed, weak and critical areas. Study of the existing construction details and drawings needs to be conducted for locating the construction joints. The detailed photographic records of every distress shall be captured and built drawings would be verified as a part of the survey to get a detailed account of the visible distresses in the structure.

B. Non Destructive Techniques for precise assessment of defects

Ultrasonic Pulse Velocity (UPV) test shall be carried out on the RCC retaining wall at close intervals to ascertain the possibility of voids/crack/honeycombing etc. inside the concrete matrix at the representative locations where the test needs to be carried out.

Ground Penetrating Radar (GPR) Survey shall be carried out to check the existing condition of the RCC elements for any defects/voids.

Thermography/Infrared Survey shall be performed to identify the sources of leakages. Thermal images of all the areas would be scrutinized in two stages i.e. in the first stage; the images would be taken when the entire area is dry, and in the next stage, the entire area would be made damp for further imaging.

Based on the observations, photographic evidences, inferences of the NDT and the emerging conclusions on the present condition of the structure, the repair materials and methodology needs to be precise defined. Further, this repair methodology will depend on the extent of the distress zones on structural elements.

C. Suggested repair methodology

The repair methodology is suggested in two stages.

First stage: (Prevention)

The existing garden (Fig. 1) soil needs to be removed and the total slab beneath the soil needs to be treated for waterproofing. Further, the water seepage from any water outlets should be arrested. All the opening Manhole (open ducts/access points) shall be closed properly. Damaged concrete covers need to be replaced immediately. The gap at the junction of wall and the tiles (on the ramp) towards the parking (Basement) needs to be filled with cement based materials. The water drains need to be cleaned on regular basis especially before monsoon. The joints of the stone tiles on the stairs shall be fixed with appropriate sealants/binders. The above suggestions may help to reduce the water/moisture to percolate through slabs in basement, in turn the probability of dampness and seepage can be reduced to a greater extent.

Second stage: (Treatment)

The following materials shall be used depending on the intensity of defect or water pressure (floor of basement- level 2). Based on GPR and Thermography, the weak zones/Seepage zones will be located precisely. Once the seepage zones and the permeable path is identified, injection-grouting using the following repair materials may be suitable to fill the cavities, permeable pores etc.

1. Non shrinkable Cement based grouts (or)
2. Polymer based grouts.

Prior to monsoon, all the treatment shall be completed. During Monsoon, the assessment shall be continued. In case of water oozing, brickwork partition (approximately 10 ft × 10 ft × 1 brick height) on the floor shall be created. This procedure will isolate the key points of weak zones and contain the water without flooding the other areas. Then these weak zones need to be treated precisely. This work shall be carried out in phases. In case of very high water pressure, for which grouting is not withstanding, Structural overlay (if needed) can be done. The above mentioned repair method is cost effective.

In case, the above method is not able to fix the issues, then alternative suggestion would be to use Elastomer Rigid foam resin grout. This is relatively expensive repair. This product needs to conform to Indian or International standards. All the relevant details and test certificates from Manufacturer shall be submitted to Engineer in-charge. The resin will fill the voids, consolidate and also block the seepage path even under heavy flows.

Many a times, even if repair methodology is appropriate, poor execution of the repair may lead to undesirable results. So, while selecting the contractors/applicators, please make sure that, they have very good experience and delivered quality work in projects with waterproofing of basements. It is desirable to have a contractor who has successfully completed some similar projects in BKC itself. Further, the contractor or applicator would need to take all necessary precautions to ensure no damage to any utilities (water pumps, drainage pipes etc.) due to grouting, excessive pressure or any associated activities. Special care needs to be taken at the edges of the water proofing layers/grouts especially close-outs at the edges and the cut-outs for pipes (if any). The detailing and workmanship involved in the water-proofing process is a critical element defining the effectiveness and success of such interventions.

11/3/2019

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24-04-2019

To

The Chief General Manager

National Bank for Agriculture and Rural Development (NABARD),

Plot C -24, G Block, BKC, Bandra (E), Mumbai – 400051.

Dear Sir

Sub: Basement waterproofing of NABARD, Head Office Building, Mumbai

Ref: No. NB.DPSP/100/HO-39/2018-19 dated 10.04.2019

Based on the reference cited above, seeking advice on some more details on the repair work suggested through the report, a meeting held on 22 April 2019 at 4 pm in IIT Bombay with Mr. Ajith Kumar Pittan and Ms. Amala S Maheshwari from NABARD.

Based on the queries raised and the discussion with NABARD Team, the response to the queries are given in the annexure.

डी पी एस पी / D P S P
आवक क्रमांक 98
Inward No. .....
02 MAY 2019
राष्ट्रीय कृषि और ग्रामीण विकास बैंक, मुंबई
NATIONAL BANK FOR AGRICULTURE AND RURAL DEVELOPMENT, MUMBAI

24/4/2019

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Annexure

I. Detailed specifications are required for the following repair methodologies recommended by you.

a.

i. Injection grouting of effected surface has been recommended as a treatment measure. However, the type of injection grouting that should be used needs more detailing.

Response: Non-shrinkable cementitious microfine prepacked grout shall be used for injection grouting. Using the NDT techniques, the weak zones shall be identified. Further, the drill holes shall be made properly covering the weak zones. After addition of water, the grout shall be constant agitated and adequate quantity is prepared for continuous injection process. During injection grouting, appropriate pressure shall be applied. The injection grouts shall have a compressive strength of at least 45 MPa at 28 days.

ii. In view of continuous leakage in all seasons at certain locations of basement floor walls, your opinion about application of polyurethane grout with detailed specification may be given.

Response: Polyurethane based Duromer Resin shall be used to fill the voids, consolidate and block the seepage path in case of heavy flows by foaming action. It shall have capacity of expansion not more than 2-10 times. The resin grout shall have sufficient strength to perform under water pressure. Product shall conform to Indian or International standards, all the relevant details and test certificates from Manufacturer are to be submitted to Engineer in charge.

Viscosity not more than: 250 - 300 mPa.s

Compressive strength > 70 MPa

Flexural tensile strength Approx. 65 Mpa

Volume of expansion in contact with water between 2-10 times.

b. Structural overlay is another treatment methodology that has been recommended, however, detailed specification including the desirable type and thickness of overlay for waterproofing is not specified.

Response: The overlay shall be high workable concrete with one grade more than the raft concrete grade. The overlay thickness shall be maximum of 75 mm.

24/4/2019 24/4/2019

II. The following details are missing in the report:

a. Methodology of treatment of leakage in the lower basement flooring.

Please refer the section I.

b. Treatment methodology for leakage at the expansion joints in the basement floors.

Response: Use of polyurethane based sealant along with backer rod (of suitable dimension) as filler material shall be used.

c. Specification of waterproofing of basement slab at ground level including comments about uprooting and removal of trees above the basement floor.

Response: The soil in the garden area shall be cleared along with uprooting of trees to perform treatment of the slab beneath. The following procedure shall be adopted.

1. Cleaning the surface and grinding the concrete top surface with suitable tools to identify the cracks at surface (if any).
2. Cleaning and filling the cracks shall be done. If needed, grouting shall be done.
3. Preparation of the surface (dry) for receiving the waterproofing materials. Apply the acrylic elastomeric or poly urethane based water proofing coatings (2 coats in perpendicular direction). The container contacting the polymers shall be thoroughly agitated before application for getting the uniformity in the coating.
4. Inspection of pin holes (if any). Screed for protection shall be done. Water ponding test shall be done.

Post treatment, the soil shall be refilled and garden shall be maintained. Big trees with huge root possibilities shall be avoided.

General suggestion for successful treatment of structural elements waterproofing

1. Proper surface preparation
2. Meticulous application of selected waterproofing materials and techniques.
3. Protection of the applied waterproofing materials.

24/4/2019

Dr. Prakash Nanthagopalan

24/4/2019

Dr. Venkata Santosh Kumar Delhi

Appendix II

Observations and Distress Mapping of the basement area

2. OBSERVATIONS

Lower Basement :

The internal wall of the building shows leakages, cracks, crazing & fungus in plaster at most of the locations. Random cracks are seen at internal walls as noticed during survey. Paint peeling, Fungus, crazing is the common factor at the entire internal surface of the building.

Water Table is high at Lower Basement

Seepage through Walls

Joint Crack Heavy Leakage at Staircase area

Steel Exposed at Beam and Leakage at Construction Joint

Stagnation of water are seen at flooring area due to rise of ground water table. Structural cracks are seen at RCC beams, slabs, etc. due t o corrosion, leakages through adjoining area, etc. as noticed during survey. Steel found exposed at several location of slabs. Refer photograph exhibits for more details.

Heavy Leakage at Inlet and Outlet Pipes Beam Crack

Heavy Seepage at Passage Area

Upper Basement :

The walls at construction joints show heavy seepage of water. Steel exposed, Major & Minor Cracks, crazing, and algae growths were are also noticed at several RCC beam and columns. Heavy seepage of water seen from outlets and inlets from external surface along the pipe lines.

BAD CONDITION HAS BEEN NOTICED AT CONSTRUCTION JOINT

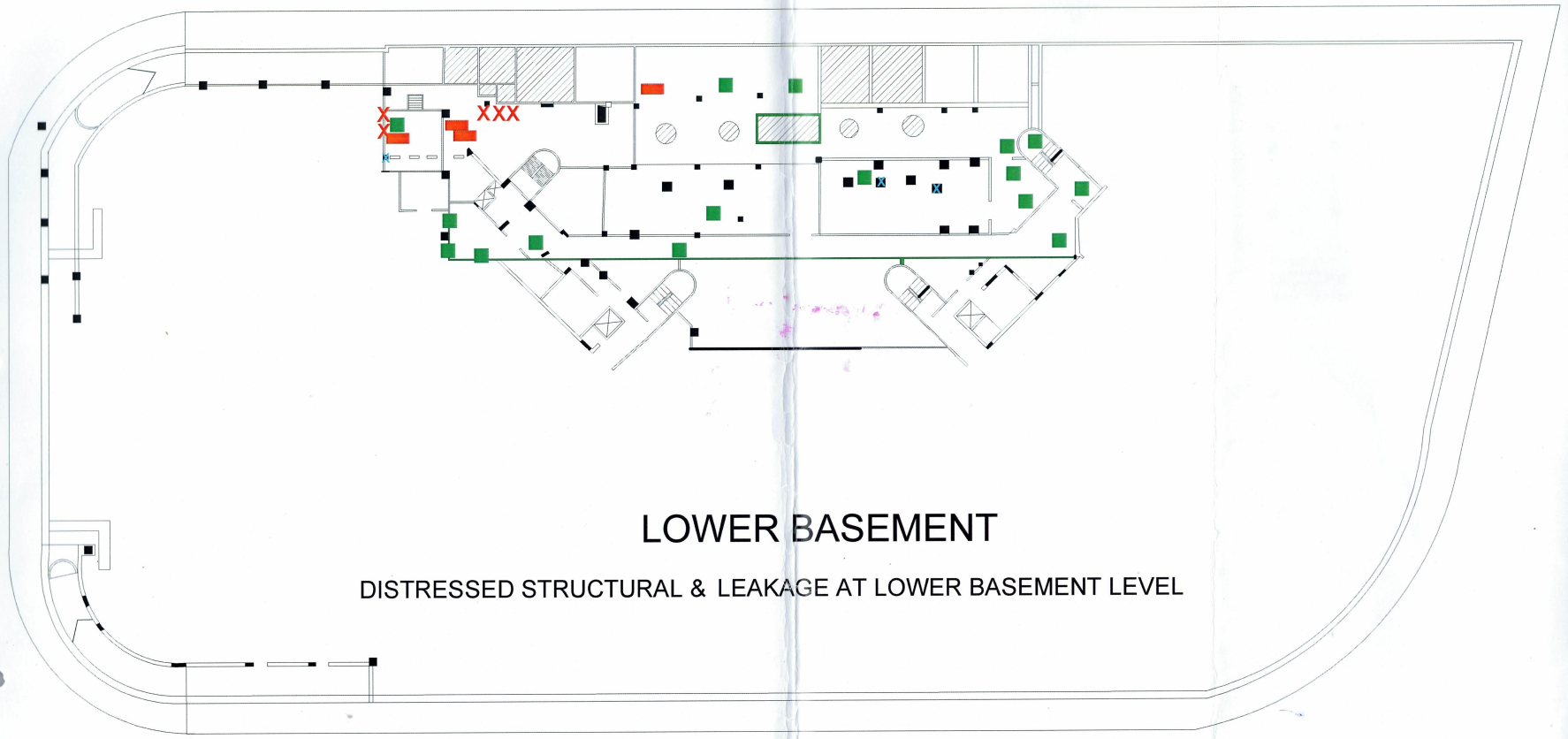
PLUMBING LINES IN BAD CONDITION AT JUNCTIONS

Major Structural cracks along main reinforcement bar are seen at several location of RCC members. Moreover, steel found exposed at several location indicating the rate of corrosion is very high.

STEEL EXPOSED AT CEILING AREA

BEAM CRACK AND HEAVY LEAKAGE AT JUNCTION AREA

3. DISTRESS MAPPING

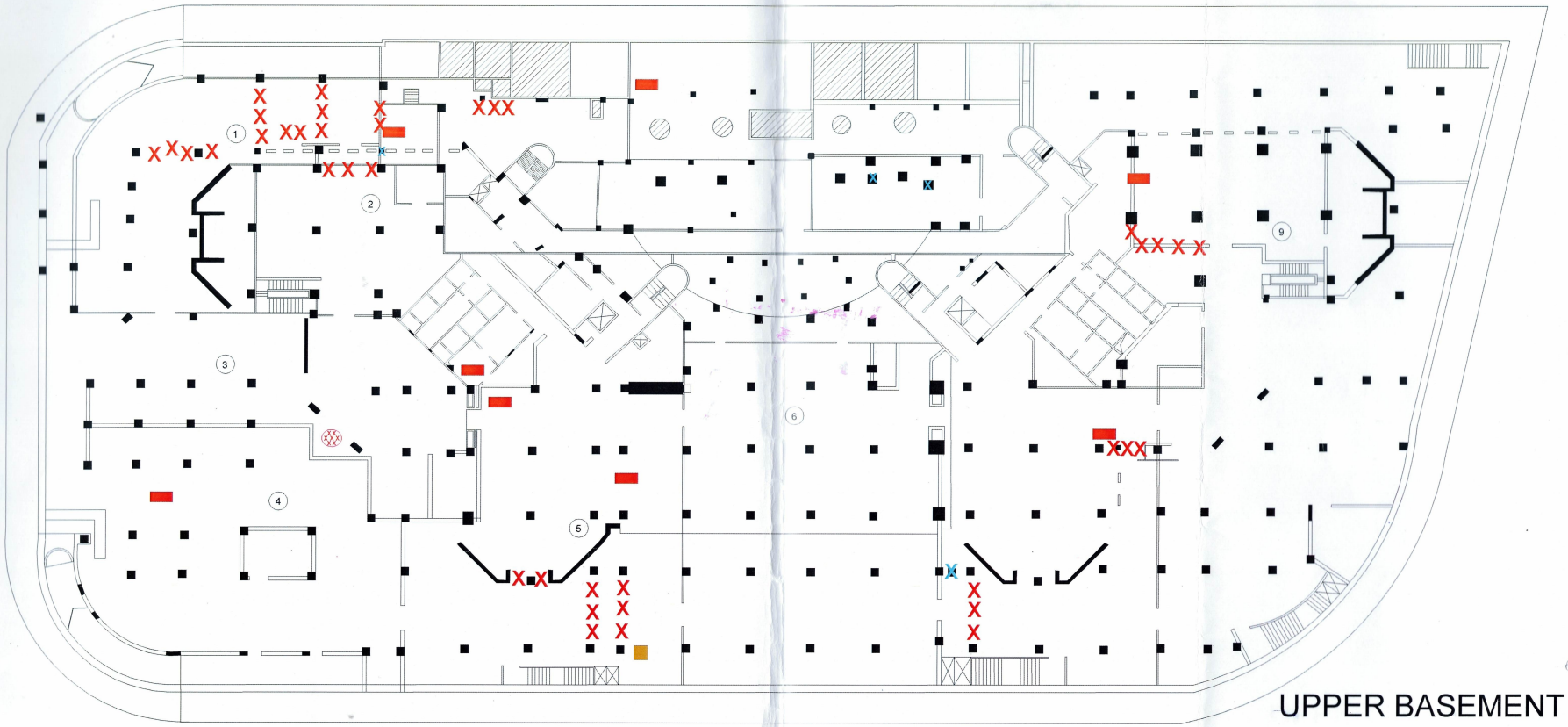


LOWER BASEMENT

DISTRESSED STRUCTURAL & LEAKAGE AT LOWER BASEMENT LEVEL

LEGEND SHEET

X	- BEAM CRACK	~	- SEPARATION CRACK	*	- BEAM HOLLOW	▬	- STEEL EXPOSED
■	- LEAKAGE	■	- PAINT PEELING	X	- TILE CRACK	■	- CEILING LEAKAGE
■	- LEAKAGE FROM INTERNAL WALL	X	-COLUMN CRACK	~	- BEAM WALL DELAMINATION	~	- WALL CRACK
■	- INTERNAL FLATS LEAKAGE	▦	- UNEVEN FLOORING	⊗	- CEILING CRACK	*	- COLUMN HOLLOW
EM	- ENCROACHMENT						

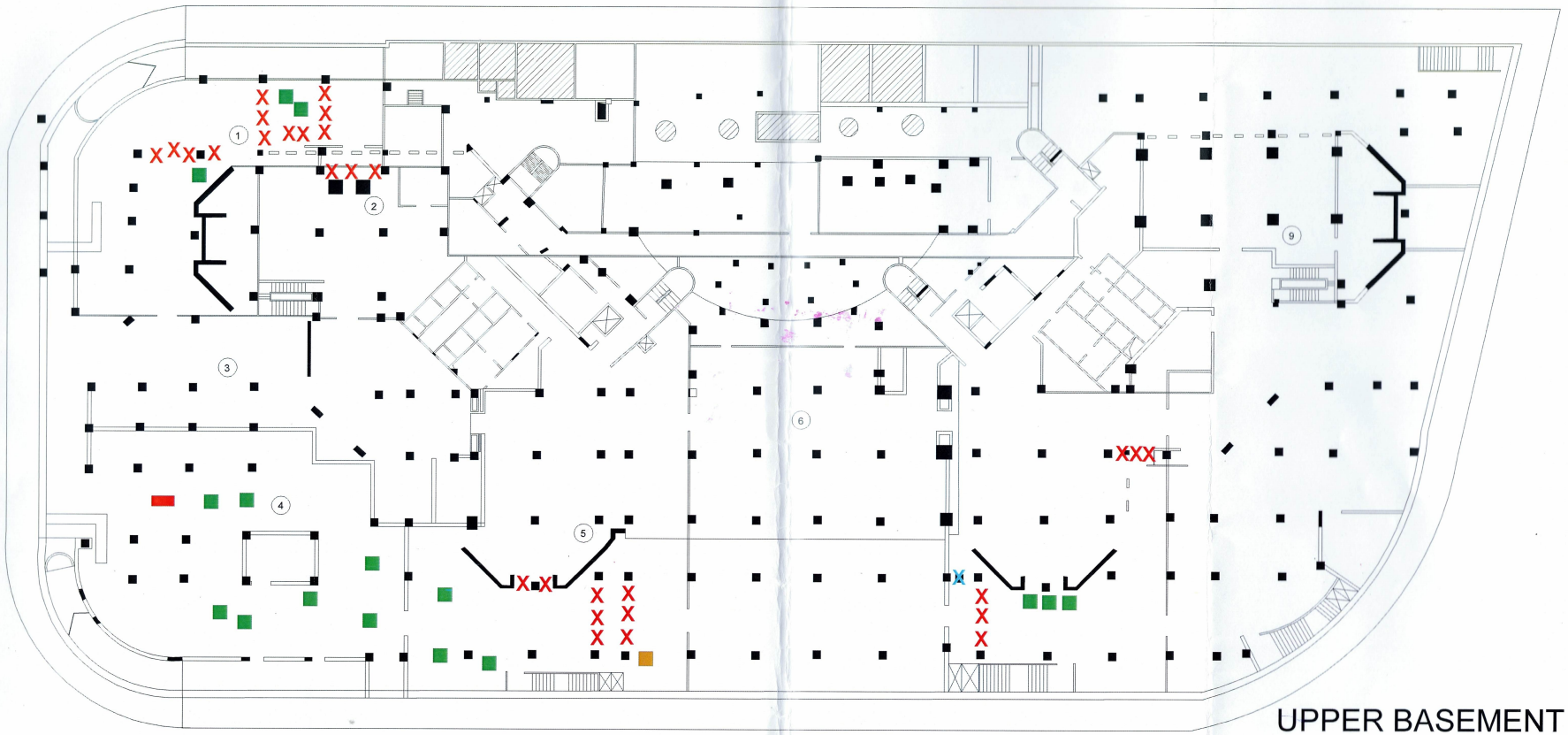


UPPER BASEMENT

DISTRESSED STRUCTURAL MEMBERS

LEGEND SHEET

X	- BEAM CRACK	~	- SEPARATION CRACK	*	- BEAM HOLLOW	▬	- STEEL EXPOSED
■	- LEAKAGE	■	- PAINT PEELING	X	- TILE CRACK	■	- CEILING LEAKAGE
■	- LEAKAGE FROM INTERNAL WALL	X	-COLUMN CRACK	~	- BEAM WALL DELAMINATION	~	- WALL CRACK
■	- INTERNAL FLATS LEAKAGE	⁘	- UNEVEN FLOORING	⊛	- CEILING CRACK	*	- COLUMN HOLLOW
EM	- ENCROACHMENT						



UPPER BASEMENT

LEAKAGE THROUGH LANDSCAPE, COMPOUND BLOCKWORK, EXHAUST,OUTLETS AND BUILDING WALLS

LEGEND SHEET

X	- BEAM CRACK	~	- SEPARATION CRACK	*	- BEAM HOLLOW	▬	- STEEL EXPOSED
■	- LEAKAGE	■	- PAINT PEELING	X	- TILE CRACK	■	- CEILING LEAKAGE
■	- LEAKAGE FROM INTERNAL WALL	X	-COLUMN CRACK	~	- BEAM WALL DELAMINATION	~	- WALL CRACK
■	- INTERNAL FLATS LEAKAGE	▦	- UNEVEN FLOORING	⊗	- CEILING CRACK	*	- COLUMN HOLLOW
EM	- ENCROACHMENT						

Appendix III

Portions of the Structural Audit Report of HO building

Pertaining to the basement area

Jan-Mar 2019

STRUCTURAL AUDIT REPORT OF NABARD HEAD OFFICE BUILDING AT BKC, BANDRA (E), MUMBAI.

CLIENT

NABARD

Prepared by:

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UPV TEST RESULTS

HEAD OFFICE BUILDING,NABARD,BKC,MUMBAI.						
UPV TEST READINGS (BASEMENT TO LOWER BASEMENT AREA)						
Sr. No.	R.C.C. COLUMN/ SHEAR WALL	VELOCITY (km/Sec.) Set 1	VELOCITY (km/Sec.) Set 1	AVERAGE VELOCITY (km/Sec.)	METHOD OF TESTING	REMARKS
ZONE-I						
1	H-2A	0.71	0.65	0.68	SD	
2	H-4	1.86	1.90	1.88	ID	
3	H-5	3.86	3.64	3.75	SD	
4	SW-2/C	1.73	1.68	1.71	ID	
5	SW-2/B	1.01	1.02	1.02	ID	
6	I'-2	1.06	1.04	1.05	SD	
7	I'-2A	7.63	6.81	7.22	D	
8	J'-2	1.44	1.42	1.43	ID	
9	J'-2A	3.48	3.34	3.41	D	
10	J-4	1.92	1.75	1.84	D	
11	J-5	0.76	0.75	0.76	ID	
12	SW-2/A	1.55	1.45	1.50	ID	
13	SW-1/B	1.02	1.00	1.01	SD	
14	K'-2A	2.79	2.68	2.73	D	
15	K'-2	1.61	1.58	1.59	ID	
16	L-2	1.79	1.65	1.72	SD	
17	L-2A	3.26	3.19	3.22	D	
18	C1	0.83	0.73	0.78	ID	
19	C2	1.48	1.34	1.41	ID	
20	L-4	1.67	1.66	1.67	D	
21	M-4	2.92	2.94	2.93	SD	Hollow
22	M-5	3.67	3.58	3.62	D	
23	M-6	4.24	3.95	4.09	D	
24	L-5	1.14	1.06	1.10	SD	
25	SW-1/A	1.25	1.17	1.21	ID	
ZONE-II						
26	I-6	5.24	4.87	5.06	D	
27	J-6	12.88	12.18	12.53	D	
28	K-6	4.14	3.64	3.89	SD	
29	K-7	1.44	1.39	1.41	ID	Hollow
30	J-7	14.87	13.21	14.04	D	
31	I-7	12.32	12.15	12.24	D	
32	C9	1.47	1.47	1.47	ID	
33	J-8	3.25	3.05	3.15	SD	
ZONE-III						

34	F'-2	2.84	2.79	2.81	SD	
35	E'-3	0.55	0.90	0.73	ID	
36	E'-4	0.83	0.82	0.83	ID	
37	E'-5	1.74	1.70	1.72	ID	
38	E'-6	0.68	0.67	0.68	ID	
39	6-E-7	5.12	4.80	4.96	D	
40	F-6-E'	2.19	2.15	2.17	D	
41	F'-3	3.13	3.11	3.12	D	
42	F'-4	2.70	2.72	2.71	D	
43	F'-5	4.16	3.83	4.00	D	
44	G-7	5.36	5.08	5.22	D	
45	F-7	4.44	4.30	4.37	D	Hollow
46	F-8 @ 0.5m	3.43	2.97	3.20	D	Hollow
47	F-9 @ 0.5m	1.94	1.93	1.94	D	
48	H-7	1.31	1.30	1.30	ID	
49	C3	1.53	1.53	1.53	D	
50	C4	0.47	0.47	0.47	ID	Hollow
51	C6	2.13	1.92	2.02	ID	
52	C7	1.14	1.12	1.13	ID	
53	F-8 @ 1.2m	1.08	1.04	1.06	ID	
54	F-9 @ 1.0m	0.60	0.59	0.60	ID	
ZONE-IV						
55	D-2	3.33	3.31	3.32	D	
56	D-3	2.92	2.89	2.90	D	Hollow
57	D-4	2.12	2.11	2.12	D	
58	D-5	1.86	1.85	1.85	D	
59	D-6	4.19	4.10	4.14	SD	
60	C'-3	2.10	2.12	2.11	SD	
61	C'-4	3.53	3.18	3.35	D	
62	C-10	3.51	3.38	3.44	D	
63	C'-7	1.54	1.52	1.53	D	
64	B-3	1.00	0.98	0.99	ID	
65	B-4	2.68	2.70	2.69	D	
66	C10	2.64	2.41	2.52	ID	
ZONE-V						
67	F-11	2.97	2.75	2.86	SD	
68	F-12 @ 0.5m	2.73	2.74	2.74	D	
69	F-12 @ 2.0m	1.57	1.48	1.53	ID	
70	F-15 @ 0.5m	1.45	1.35	1.40	SD	
71	E-15 @ Bottom	3.60	3.46	3.53	D	
72	E-15 @	3.60	3.46	3.53	ID	

	2.0m					
73	E-12 @ 0.2m	2.81	2.79	2.80	D	
74	E-12 @ 1.5m	2.92	2.76	2.84	ID	
75	E-11 @ Bottom	3.08	2.98	3.03	D	
76	E-11 @ 2.2m	0.21	0.22	0.22	ID	
77	F-15 @ 1.2m	2.40	2.28	2.34	ID	
78	D-11 @ 0.1m	2.59	2.80	2.70	D	
79	D-11 @ 1.5m	2.05	2.02	2.04	ID	
80	D-12 @ Bottom	15.24	14.51	14.88	D	
81	D-12 @ 1.5m	1.45	1.38	1.41	ID	
82	SW-4/C	2.17	2.15	2.16	SD	
83	SW-4/D	1.00	1.00	1.00	ID	
84	SW-4/E	1.34	1.24	1.29	ID	
85	C'-12	3.35	3.20	3.28	D	
86	C'-13-14	2.82	2.80	2.81	D	
87	C'-15	2.80	2.66	2.73	D	
88	C'-16	0.80	0.76	0.78	ID	
89	B-16	1.00	0.84	0.92	ID	
90	B-15	1.04	0.98	1.01	D	
91	B-12	1.03	0.98	1.00	D	
92	B-11	1.56	1.55	1.55	D	
93	B-10	4.04	3.41	3.73	SD	
94	A'-11	0.65	0.63	0.64	ID	
95	8-B-9	4.66	4.24	4.45	SD	
96	C-5	2.54	2.45	2.49	SD	
97	C'-10	3.01	3.02	3.02	D	
98	SW-3/A	1.88	1.85	1.86	ID	
99	D-10	3.69	3.46	3.58	SD	
100	SW-3/C	0.71	0.72	0.71	ID	
101	SW-3/B	1.10	1.07	1.09	ID	
102	C-11	3.27	3.14	3.21	D	
103	SW-4/B	1.44	1.42	1.43	ID	
104	SW-4/A	0.97	0.94	0.95	ID	
ZONE-VI						
105	F-16 @ 0.5m	3.41	3.17	3.29	SD	
106	F-16 @ 1.2m	0.73	0.71	0.72	ID	

107	C-11	2.01	1.68	1.84	ID	
108	F-17 @ 0.5m	2.97	3.02	3.00	D	
109	F-17 @ 2.0m	2.38	1.69	2.03	ID	
110	F-18 @ 0.5m	3.68	3.59	3.64	D	
111	F-18 @ 2.2m	2.65	3.14	2.90	ID	
112	F-19 @ 0.2m	1.93	1.89	1.91	ID	
113	F-19 @ 2.5m	1.05	1.04	1.05	ID	
114	C-12	3.20	2.30	2.75	SD	
115	F-20	7.91	6.09	7.00	SD	
116	E-20	0.89	1.02	0.95	SD	
117	E-19 @ 0.5m	3.56	3.53	3.55	D	
118	E-19 @ 1.0m	1.34	1.27	1.30	ID	
119	E-18 @ 0.5m	3.70	3.61	3.66	D	
120	E-18 @ 1.5m	1.14	1.18	1.16	ID	
121	E-17 @ 0.5m	1.29	1.31	1.30	SD	
122	E-17 @ 1.0m	2.91	2.83	2.87	ID	
123	E-16 @ 0.2m	4.97	4.65	4.81	SD	
124	E-16 @ 2.0m	0.34	0.34	0.34	ID	
125	C'-19	15.67	14.45	15.06	D	
126	C'-18	1.65	1.62	1.63	D	
127	C'-17	1.36	1.29	1.32	ID	
128	C'-16	1.48	1.35	1.41	SD	
129	B-16	2.45	2.03	2.24	SD	
130	B-17	1.13	1.14	1.13	D	
131	B-18	1.95	1.94	1.94	D	
132	B-19	2.89	2.87	2.88	D	
133	B-20	3.17	3.06	3.11	SD	
ZONE-VII						
134	F-23 @ 0.5m	1.77	1.76	1.77	SD	
135	F-23 @ 0.8m	3.55	3.21	3.38	SD	
136	C-13	1.06	1.01	1.04	ID	
137	F-24 @ 0.6m	0.55	0.55	0.55	ID	
138	F-24 @	3.19	2.99	3.09	SD	

	1.2m					
139	F-25 @ 0.2m	1.54	1.87	1.70	ID	
140	F-25 @ 1.5m	1.34	1.27	1.30	ID	
141	F-26 @ 0.5m	1.42	1.36	1.39	ID	
142	F-26 @ 1.2m	3.10	2.68	2.89	ID	
143	E-26 @ Bottom	3.41	3.32	3.36	D	
144	E-26 @ 1.0m	0.88	0.85	0.86	SD	
145	E-25 @ 0.5m	2.22	2.28	2.25	D	
146	E-25 @ 1.2m	0.98	0.92	0.95	ID	
147	E-24 @ 0.5m	3.56	3.40	3.48	D	
148	E-24 @ 1.0m	1.35	1.40	1.38	ID	
149	E-23 @ 0.2m	3.49	3.48	3.48	D	
150	E-23 @ 1.0m	0.98	0.98	0.98	SD	
151	D-23 @ 0.2m	5.93	5.94	5.94	D	
152	D-23 @ 1.5m	3.84	3.01	3.42	SD	
153	D20	1.41	1.38	1.40	SD	
154	D-24 @ 0.5m	3.86	3.72	3.79	D	
155	D-24 @ 2.0m	4.66	3.34	4.00	SD	
156	D-25 @ 0.5m	2.14	2.13	2.13	D	
157	D-25 @ 1.0m	3.04	2.93	2.98	SD	
158	D-26	2.45	2.38	2.41	D	
159	SW-5/E @ 0.5m	2.01	2.05	2.03	ID	
160	SW-5/E @ 1.0m	1.15	1.01	1.08	ID	
161	SW-5/D	0.88	0.86	0.87	ID	
162	SW-5/C @ 0.2m	2.10	2.04	2.07	ID	
163	SW-5/C @ 1.2m	1.60	1.36	1.48	ID	
164	C-24	4.35	4.24	4.30	ID	
165	SW-6/A @ 0.2m	1.18	1.13	1.15	ID	
166	SW-6/A @	2.14	2.15	2.14	ID	

	1.2m					
167	SW-6/C	1.09	1.10	1.10	ID	
168	SW-6/D	2.18	2.01	2.09	ID	
169	SW-6/E	1.68	1.77	1.73	ID	
170	SW-6/F	1.38	1.36	1.37	ID	
171	C'-25	1.72	1.68	1.70	D	
172	B-25	2.32	1.90	2.11	D	
173	B-27	0.27	0.26	0.27	ID	
174	SW-6/B	0.91	0.91	0.91	ID	
175	A-24	3.36	3.22	3.29	D	
176	B'-24	2.63	2.49	2.56	ID	
177	A'-23	3.21	2.58	2.90	SD	Exposed
178	B-23	3.94	3.87	3.90	D	
179	C'-23	1.79	1.76	1.77	D	
180	C'-20	14.20	13.09	13.65	D	Exposed/ Hollow
181	SW-5/B	1.95	1.86	1.91	ID	
182	SW-5/A	0.95	0.92	0.93	ID	
183	C14	3.51	3.52	3.51	D	
			ZONE-VIII			
184	C-15 @ 0.5m	6.80	6.96	6.88	D	
185	C-15 @ 1.2m	1.83	1.67	1.75	ID	
186	27-E-28	5.92	5.93	5.92	D	
187	E-26	1.14	1.08	1.11	ID	
188	D-26	1.46	1.46	1.46	ID	
189	C-26	11.06	10.80	10.93	D	
190	C-27	5.99	5.57	5.78	D	
191	C-29	3.41	3.35	3.38	ID	
192	F'-28	0.93	0.93	0.93	ID	
193	F-28	0.70	0.69	0.69	ID	
194	H-28 @ 0.2m	1.52	1.50	1.51	SD	
195	H-28 @ 1.5m	0.37	0.36	0.37	ID	
196	I-28 @ 0.4m	0.84	0.77	0.80	ID	
197	I-28 @ 1.0m	18.32	14.58	16.45	D	
198	C17	1.30	1.30	1.30	ID	
199	C18	1.73	1.76	1.75	ID	
200	C19	1.13	1.12	1.13	ID	
201	C'-29	1.93	1.89	1.91	SD	
202	D-29	1.51	1.44	1.48	ID	
203	E-29	0.73	0.72	0.72	ID	

204	E'-29	3.60	3.56	3.58	D	
205	E'-30	1.49	1.48	1.49	D	
206	E'-31	2.57	2.55	2.56	D	
207	H-31	0.29	0.30	0.30	ID	
208	H-29	1.03	1.01	1.02	SD	
209	E-31	2.16	2.19	2.18	D	
210	E-30	1.48	1.44	1.46	ID	
ZONE-IX						
211	J-28 @ Bottom	1.14	1.15	1.15	ID	
212	J-28 @ 2.0m	1.46	1.29	1.37	ID	
213	J-29 @ 0.2m	0.43	0.42	0.43	SD	
214	J-29 @ 1.2m	2.21	2.39	2.30	SD	
215	K-29 @ 0.5m	2.59	2.62	2.60	D	
216	K-29 @ 1.2m	1.26	1.18	1.22	ID	
217	K-28 @ Bottom	3.05	3.04	3.05	D	
218	K-28 @ 1.0m	0.49	0.48	0.48	SD	
219	L-27	4.14	2.81	3.48	SD	
220	25-L-26	3.59	13.56	8.58	SD	
221	L25	1.87	1.91	1.89	ID	
222	M-24	1.05	1.07	1.06	SD	
223	M-25	2.96	3.16	3.06	D	
224	M-26	2.27	2.26	2.26	D	
225	M-27	2.21	2.14	2.17	D	
226	M-28	2.55	2.50	2.53	D	
227	M-29	3.68	3.70	3.69	D	
228	M-30	4.33	4.31	4.32	D	
229	M-31	5.03	4.88	4.95	D	
230	L-31	2.25	2.86	2.56	D	
231	L-30	1.32	1.34	1.33	D	
232	SW-7/A	0.71	0.74	0.73	ID	
233	SW-7/B	0.63	0.65	0.64	ID	
LOWER BASEMENT						
234	C-LT-1	0.99	1.00	0.99	ID	
235	C-LT-2	0.86	0.84	0.85	ID	
236	C-LT-3	1.67	1.61	1.64	SD	
237	C-LT-4	1.62	1.59	1.61	SD	
238	C-LT-5	1.71	1.66	1.68	SD	
239	C-LT-6	3.33	3.31	3.32	D	
240	C-LT-7	0.97	0.97	0.97	ID	

241	C-LT-8	1.03	1.03	1.03	D	
242	C-LT-9	1.20	1.20	1.20	D	
243	C-LT-10	2.24	2.23	2.23	D	
244	C-LT-11	2.16	2.30	2.23	D	
245	C-LT-12	2.23	2.24	2.23	D	
246	C-LT-13	3.45	3.40	3.42	SD	
247	C-LT-14	2.95	2.93	2.94	SD	
248	C-LT-15	8.79	8.26	8.53	D	
249	C-LT-16	3.00	2.97	2.98	SD	
250	C-LT-17	2.96	3.04	3.00	SD	
251	C-LT-18	1.53	1.51	1.52	ID	
252	C-LT-19	1.99	2.01	2.00	ID	
253	C-LT-20	2.35	2.34	2.35	ID	
254	C-LT-21	1.70	1.68	1.69	ID	Hollow
255	C-LT-22	1.74	1.72	1.73	ID	
256	C-LT-23	1.62	1.58	1.60	ID	
257	C-LT-24	1.66	1.64	1.65	ID	
258	C-LT-25	1.53	1.50	1.51	ID	
259	C-LT-26	1.37	1.34	1.36	ID	
260	C-LT-27	1.15	1.14	1.15	ID	
261	C-LT-28	3.80	3.64	3.72	SD	
262	C-LT-29	2.40	2.39	2.39	SD	
263	C-LT-30	2.89	2.88	2.88	SD	
264	C-LT-31	2.15	2.37	2.26	ID	
Average integrity & deficiency				**2.59**		
Average quality of columns				**DOUBTFUL**		

HEAD OFFICE BUILDING,NABARD,BKC,MUMBAI.						
UPV TEST READINGS (BASEMENT TO LOWER BASEMENT AREA)						
Sr. No.	R.C.C. BEAMS	VELOCITY (km/Sec.) Set 1	VELOCITY (km/Sec.) Set 1	AVERAGE VELOCITY (km/Sec.)	METHOD OF TESTING	REMARKS
ZONE-I						
1	L-M-2A	3.41	3.17	3.29	SD	
2	5-M-6	0.42	0.41	0.42	SD	
3	4-M-5 @ 1.2m	2.41	2.02	2.22	SD	
4	4-M-5 @ 2.0m	0.23	0.23	0.23	SD	
5	L-2A-3	1.63	1.15	1.39	SD	
6	2A-AN-A3	1.47	1.44	1.46	D	
7	L-A3-AN	2.71	3.22	2.97	SD	
8	AN-A3-AO	8.67	8.52	8.60	D	
9	AN-2A-AO	1.05	1.04	1.05	ID	
10	2A-AO-A3	8.24	5.91	7.07	ID	
11	A3-L-A5	5.26	4.05	4.66	ID	
12	L-A5-AN	0.96	1.10	1.03	SD	
13	AN-A5-AO	1.60	1.59	1.60	D	
14	A3-AN-A5	5.36	5.08	5.22	D	
15	A5-L-4	0.74	0.72	0.73	ID	
16	A5-AN-4	5.14	5.33	5.24	D	
17	AN-4-AO	0.51	0.51	0.51	ID	
18	A1-A5-AO	2.97	2.89	2.93	SD	
19	AN-A5-AO	23.68	22.17	22.93	D	
20	AO-A5	0.34	0.34	0.34	ID	
21	CB1	1.51	1.59	1.55	ID	
22	AO-A7	0.31	0.30	0.30	SD	
23	4-AO-A7	5.43	5.14	5.29	D	
24	AN-A7-AO	1.48	1.35	1.41	SD	
25	4-AN-A7	2.45	2.03	2.24	SD	
26	L-A7-AN	0.23	0.23	0.23	SD	
27	4-L-A7	0.25	0.24	0.25	SD	
28	A7-AN-A9	1.16	1.15	1.15	ID	
29	AN-A9-AO	4.73	4.64	4.69	D	
30	AO-A9	0.63	0.60	0.62	SD	
31	A7-AO-A9	0.88	0.88	0.88	ID	
32	L-5-AN	2.31	2.29	2.30	D	
33	5-AN-A11	2.21	2.24	2.22	D	
34	AN-5-AO	0.62	0.60	0.61	ID	

35	5-AO-A11	0.39	0.38	0.38	SD	
36	A11-AN-A13	0.68	0.67	0.68	SD	
37	AN-AO-A13	0.34	0.32	0.33	SD	
38	L-A13-AN	0.43	0.43	0.43	SD	
39	AN-A11-AO	1.11	1.10	1.11	SD	
40	A11-AO-A13	1.12	1.09	1.10	SD	
41	AO-A13	1.92	1.89	1.90	SD	
42	AO-6	0.91	0.88	0.89	ID	
43	A13-AO-6	1.46	1.44	1.45	SD	
44	AN-6-AO	0.86	0.84	0.85	ID	
45	AO-A16	1.29	1.30	1.30	SD	
46	6-AO-A16	1.27	1.25	1.26	SD	
47	AN-A16-AO	1.03	1.04	1.04	SD	
48	AN-A18-AO	0.91	0.92	0.91	SD	
49	A16-AO-A18	1.47	1.45	1.46	SD	
50	AO-A18	1.06	1.03	1.05	SD	
51	A18-AO-7	1.35	1.34	1.34	SD	
52	A1-K'-2A	0.63	0.63	0.63	ID	
53	A1-K'-2A-AM	0.86	0.87	0.87	ID	
54	2A-K'-A3	0.99	0.97	0.98	ID	
55	K'-2A-AM	1.01	1.02	1.02	ID	
56	2A-AM-A3	0.69	0.69	0.69	ID	
57	K'-A3-AM	0.42	0.41	0.41	ID	
58	A3-K'-A5	0.83	0.81	0.82	ID	
59	A3-AL-A5	0.90	0.90	0.90	ID	
60	AL-A5-K'	1.02	1.01	1.02	ID	
61	J'-2A-AL	0.91	0.88	0.89	ID	
62	2A-J'-A3	1.00	0.97	0.98	ID	
63	H-A1-AI	0.79	0.77	0.78	ID	
64	2A-H-A3	0.89	0.85	0.87	ID	
65	H-2A-AI	1.24	1.25	1.24	ID	
66	H-A5-AI	1.01	1.02	1.02	ID	
67	A3-AI-A5	0.45	0.45	0.45	ID	
68	H-4-AI	0.41	0.44	0.42	ID	
69	A5-H-4	0.47	0.50	0.48	ID	
ZONE-II						
70	5-K-A11	0.59	0.61	0.60	ID	
71	A13-K-6	1.34	1.32	1.33	ID	

72	6-K-A16	0.69	0.70	0.70	ID	
73	K-A18-L	0.61	0.60	0.61	ID	
ZONE -III						
74	AQ-2-H	1.28	1.26	1.27	ID	
75	2-AQ-A1	1.30	1.27	1.29	ID	
76	A1-AQ-A2	0.90	0.89	0.89	ID	
77	AP-A2-AQ	0.50	0.48	0.49	ID	
78	F'-3-AP	1.38	1.43	1.40	ID	
79	A2-F'-3	2.62	2.68	2.65	ID	
80	A1-F'-A2	0.70	0.71	0.71	ID	
81	F'-A1-AP	0.56	0.56	0.56	ID	
82	3-AQ-A4	0.97	0.99	0.98	ID	
83	AP-3-AQ	3.32	3.25	3.29	ID	
84	F'-A4-AP	1.62	1.64	1.63	ID	
85	3-AP-A4	1.07	1.05	1.06	ID	
86	A5-AQ-4	0.66	0.66	0.66	ID	
87	AP-A5-AQ	1.52	1.51	1.52		
88	A6-AQ-A8	1.84	1.80	1.82	SD	
89	AP-A6-AQ	1.11	1.10	1.10	ID	
90	F'-4-AP	0.51	0.51	0.51	ID	
91	4-AP-A6	0.81	0.77	0.79	ID	
92	F'-A10-AP	0.75	0.76	0.75	ID	
93	5-F'-A10	0.52	0.49	0.51	ID	
94	F'-A12-AP	0.99	0.99	0.99	ID	
95	A10-F'-A12	0.74	0.72	0.73	ID	
96	F'-6-AP	0.42	0.40	0.41	ID	
97	A12-AP-6	0.74	0.74	0.74	ID	
ZONE-IV						
98	D-2-AE	0.96	0.90	0.93	ID	
99	AE-A1-E'	0.81	0.81	0.81	ID	
100	D-3-AE	0.41	0.41	0.41	ID	
101	A2-D-A3	0.52	0.52	0.52	ID	
102	3-AE-A4	0.85	0.85	0.85	ID	
103	AE-A4-E'	0.49	0.48	0.48	ID	
104	A4-D-A5	1.63	1.56	1.60	ID	
105	D-A5-AE	1.24	1.31	1.28	ID	
106	A1-AE-A2	0.89	0.90	0.89	ID	
Average integrity & deficiency				**1.58**		
Average quality of columns				**DOUBTFUL**		

HEAD OFFICE BUILDING,NABARD,BKC,MUMBAI.						
UPV TEST READINGS (BASEMENT TO LOWER BASEMENT AREA)						
Sr. No.	R.C.C. SLABS	VELOCITY (km/Sec.) Set 1	VELOCITY (km/Sec.) Set 1	AVERAGE VELOCITY (km/Sec.)	METHOD OF TESTING	REMARKS
ZONE-I						
1	L-M-2A-3	1.23	1.12	1.18	ID	
2	AN-2A-A3-AO	1.26	1.22	1.24	ID	
3	A3-L-AN-A5	1.90	1.96	1.93	ID	
4	AN-A3-A5-AO	1.36	1.30	1.33	ID	
5	L-A5-4-AN	1.55	1.59	1.57	ID	
6	AN-A5-4-AO	1.11	1.05	1.08	ID	
7	A5-AO-4	1.22	1.26	1.24	ID	
8	4-AO-A7	0.98	0.92	0.95	ID	
9	4-L-AN-A7	0.86	0.90	0.88	ID	
10	AN-A7-A9-AO	1.76	1.70	1.73	ID	
11	A7-AO-A9	1.05	1.04	1.04	ID	
12	5-AN-AO-A11	1.47	1.46	1.47	ID	
13	L-5-A11-AN	1.13	1.10	1.12	ID	
14	AN-A11-A13-AO	1.68	1.64	1.66	ID	
15	AO-A13	1.28	1.27	1.28	ID	
16	A13-AO-6	2.22	2.14	2.18	ID	
17	AN-A13-6-AO	0.82	0.80	0.81	ID	
18	6-AO-A16	1.83	1.80	1.82	ID	
19	AN-6-A16-AO	1.54	1.52	1.53	ID	
20	AN-A16-A18-AO	0.97	0.92	0.94	ID	
21	A16-AO-A18	0.99	0.80	0.90	ID	
22	A18-AO-7	1.02	1.02	1.02	ID	
23	AN-A18-7-AO	1.01	1.01	1.01	ID	

24	A1-K'-2A-AM	1.11	1.08	1.10	ID	
25	K'-2A-A3-AM	0.78	0.65	0.72	ID	
26	AL-A3-A5-K'	1.13	1.07	1.10	ID	
27	J'-2A-A3-AL	1.38	1.35	1.37	ID	
28	H-A1-2A-AI	0.74	0.72	0.73	ID	
29	H-A3-A5-AI	0.80	0.76	0.78	ID	
30	H-A5-4-AI	1.26	1.22	1.24	ID	
ZONE-II						
31	K-6-A16-L	1.01	1.03	1.02	ID	
32	K-A18-7-L	0.97	0.92	0.95	ID	
ZONE-III						
33	AQ-2-A1-H	0.81	0.79	0.80	ID	
34	AP-A1-A2-AQ	0.69	0.68	0.69	ID	
35	A2-F-AP-3	1.03	1.01	1.02	ID	
36	F'-A1-A2-AP	1.08	1.07	1.08	ID	
37	AP-3-A4-AQ	0.71	0.70	0.70	ID	
38	F'-3-A4-AP	0.90	0.86	0.88	ID	
39	AP-A4-A5-AQ	1.21	1.02	1.12	ID	
40	AP-A6-A8-AQ	0.75	0.75	0.75	ID	
41	F'-4-A6-AP	0.96	0.95	0.96	ID	
ZONE-IV						
42	D-A2-3-AE	1.26	1.24	1.25	ID	
43	AE-3-A4-E'	1.75	1.74	1.74	ID	
44	D-A4-A5-AE	1.32	1.31	1.31	ID	
45	D-A1-AL-AE	1.36	1.37	1.37	ID	
Average integrity & deficiency				**1.17**		
Average quality of columns				**DOUBTFUL**		

CARBONATION TEST RESULT

HEAD OFFICE BUILDING,NABARD,BKC,MUMBAI.				
CARBONATION TEST RESULTS (Basement & Lower Basement)				
SR.NO	R.C.C COLUMN/BEAM/SW	Drill Depth (mm)	COLOUR INDICATION	DEPTH OF (mm) CARBONATION
ZONE-I				
1	J'-2A	70	CC	65
2	L'-4	70	CC	60
3	4-M-5	45	CC	40
4	M-6	72	CC	72
5	SW-1/B	82	CC	75
6	J-5	60	CC	60
7	L-5	65	CC	60
8	M-4	60	CC	55
ZONE-II				
9	I-7	75	CC	70
10	C-9	70	CC	65
11	J-8	55	LCC	50
12	K-6	55	CC	50
13	K-7	60	CC	60
ZONE-III				
14	F'-4	90	CC	85
15	F'-5	70	CC	65
16	F-7	80	CC	80
17	C3	65	CC	65
18	H-2A	70	CC	70
19	6-E-7	65	LCC	60
ZONE-IV				
20	B-3	60	CC	60
21	C'-3	60	CC	90
22	C'-4	75	CC	70
23	D-5	65	CC	65
24	C'-7	65	CC	65
25	C-4	65	CC	60
26	D-2	80	CC	75
ZONE-V				
27	E-15	70	CC	70
28	F-15	65	LCC	65
29	E-11	70	CC	70
30	E-10	80	LCC	75
31	C-11	80	CC	75
32	SW-4/C	78	CC	75

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33	B-12	65	LCC	65
34	B-10	50	CC	50
		ZONE-VI		
35	F-17	90	CC	90
36	F-19	100	CC	100
37	E-19	75	CC	75
38	C'-19	60	CC	60
39	B-18	55	CC	55
40	C'-17	75	CC	75
		ZONE-VII		
41	E-23	70	CC	65
42	F-25	90	CC	85
43	E-25	70	CC	65
44	D-25	75	LCC	75
45	D-24	60	CC	60
46	C-24	72	CC	72
47	SW-5/C	60	LCC	55
48	C'-25	74	CC	70
		ZONE-VIII		
49	F-28	80	CC	75
50	28-E-29	45	CC	45
51	C-15	65	CC	65
52	C-17	59	CC	59
53	E-27	65	CC	65
54	C-19	70	CC	65
55	B-29	88	CC	85
56	A43-C-30	50	CC	50
57	E-30	95	CC	90
58	I-28	80	CC	75
59	H-28	80	CC	75
60	C-29	100	CC	95
61	E'-30	85	CC	85
		ZONE-IX		
62	J-28	80	CC	80
63	K-29	65	CC	65
64	SW-7/A	60	CC	60
65	L-31	65	CC	65
66	M-30	55	CC	55
67	M-28	55	CC	55
68	M-26	55	CC	55
69	25-L-26	80	CC	80
70	L-26	82	CC	82
71	RCC stair wall	70	CC	70

CORRODION TEST RESULTS

HEAD OFFICE BUILDING,NABARD,BKC,MUMBAI.									
HALF-CELL POTENSIOMETER (CORROSION) TEST RESULTS (BASEMENT TO LOWER BASEMENT)									
Sr. No.	R.C.C. Member Column, beam, shear wall	Half-cell potential (-mV)						Average half cell potential (-mV)	Probability of corrosion
ZONE-I									
1	J'-2A	220	180	191	202	194	210	200	<5%
2	L'-4	177	173	178	172	188	190	180	<5%
3	4-M-5	192	210	225	221	214	198	210	50%
4	M-6	182	185	187	189	187	190	187	<5%
5	SW-1/B	174	175	178	177	180	182	178	<5%
6	J-5	195	197	199	200	204	204	200	<5%
7	L-5	208	210	215	214	216	209	212	50%
8	M-4	184	187	189	190	194	200	191	<5%
ZONE-II									
9	I-7	190	199	198	185	200	196	195	<5%
10	C-9	184	185	187	188	189	191	187	<5%
11	J-8	154	158	156	155	157	152	155	<5%
12	K-6	174	170	168	165	164	170	169	<5%
13	K-7	215	214	217	218	219	220	217	50%
ZONE-III									
14	F'-4	200	201	206	211	203	206	205	50%
15	F'-5	196	190	210	201	203	194	199	<5%
16	F-7	169	171	175	178	179	177	175	<5%
17	C3	155	156	152	153	154	151	154	<5%
18	H-2A	191	192	191	194	196	195	193	<5%
19	6-E-7	201	205	206	208	209	202	205	50%
ZONE-IV									
20	B-3	174	172	171	169	173	175	172	<5%
21	C'-3	214	215	216	217	215	220	216	50%
22	C'-4	145	144	142	143	141	139	142	<5%
23	D-5	179	181	182	185	187	188	184	<5%
24	C'-7	201	200	205	204	203	202	203	50%
25	C-4	209	211	208	213	214	215	212	50%
26	D-2	165	164	161	159	158	157	161	<5%
ZONE-V									
27	E-15	145	144	148	149	150	152	148	<5%

28	F-15	188	187	184	183	182	184	185	<5%
29	E-11	194	193	196	195	192	191	194	<5%
30	E-10	175	178	189	185	186	178	182	<5%
31	C-11	124	125	124	123	136	135	128	<5%
32	SW-4/C	145	149	141	142	135	134	141	<5%
33	B-12	201	205	204	203	208	209	205	50%
34	B-10	205	201	199	198	194	195	199	<5%
ZONE-VI									
35	F-17	195	194	193	197	198	199	196	<5%
36	F-19	183	185	187	185	165	194	183	<5%
37	E-19	215	214	209	208	207	206	210	50%
38	C'-19	174	172	171	169	173	175	172	<5%
39	B-18	165	164	161	162	159	158	162	<5%
40	C'-17	137	138	139	140	141	144	140	<5%
ZONE-VII									
41	E-23	101	103	104	106	105	102	104	<5%
42	F-25	121	119	118	124	123	125	122	<5%
43	E-25	127	128	129	130	132	133	130	<5%
44	D-25	178	177	175	174	171	172	175	<5%
45	D-24	144	141	142	143	141	145	143	<5%
46	C-24	133	131	130	129	128	127	130	<5%
47	SW-5/C	196	194	197	198	199	201	198	<5%
48	C'-25	214	213	212	211	209	208	211	50%
ZONE-VIII									
49	F-28	128	127	125	124	123	121	125	<5%
50	28-E-29	131	130	124	129	121	119	126	<5%
51	C-15	196	189	191	193	197	195	194	<5%
52	C-17	142	148	147	146	145	141	145	<5%
53	E-27	170	169	172	173	171	178	172	<5%
54	C-19	222	230	225	227	229	226	227	50%
55	B-29	159	155	152	153	154	151	154	<5%
56	A43-C-30	174	175	171	172	177	175	174	<5%
57	E-30	205	207	208	204	202	201	205	50%
58	I-28	218	219	220	221	213	214	218	50%
59	H-28	125	127	129	130	128	126	128	<5%
60	C-29	179	181	182	188	187	185	184	<5%
61	E'-30	155	154	153	158	157	156	156	<5%
ZONE-IX									
62	J-28	187	188	185	181	184	183	185	<5%
63	K-29	162	152	151	159	157	160	157	<5%
64	SW-7/A	195	194	195	199	201	200	197	<5%
65	L-31	167	168	169	170	175	174	171	<5%
66	M-30	152	151	153	158	159	161	156	<5%

50%	-200 to –350mV
<5%	More positive than –200mV

PROFOMETER TEST RESULTS

HEAD OFFICE BUILDING,NABARD,BKC,MUMBAI.				
PROFOMETER SCAN RESULTS (BASEMENT TO LOWER BASEMENT)				
Sr. No.	**R.C.C. Member**	**Diameter of Bar (mm)**	**Cover Concrete (mm)**	**Remark**
ZONE-I				
1	J'-2A	20	46	
2	L'-4	20	52	
3	4-M-5	20	26	
4	M-6	20	53	
5	SW-1/B	20	58	
6	J-5	20	46	
7	L-5	20	62	Hollow
8	M-4	20	30	
ZONE-II				
9	I-7	20	42	
10	C-9	20	40	
11	J-8	20	38	
12	K-6	20	37	
13	K-7	20	40	
ZONE-III				
14	F'-4	20	47	
15	F'-5	20	50	
16	F-7	20	54	
17	C3	20	46	
18	H-2A	20	64	
19	6-E-7	20	51	
ZONE-IV				
20	B-3	20	41	
21	C'-3	20	51	
22	C'-4	20	50	
23	D-5	20	51	
24	C'-7	20	49	
25	C-4	20	54	
26	D-2	20	55	
ZONE-V				
27	E-15	20	42	
28	F-15	20	35	

29	E-11	20	41	
30	E-10	20	68	
31	C-11	20	62	
32	SW-4/C	20	52	
33	B-12	20	50	
34	B-10	20	47	
ZONE-VI				
35	F-17	20	60	
36	F-19	20	39	
37	F-19	20	58	
38	C'-19	20	45	
39	B-18	20	37	
40	C'-17	20	38	
ZONE-VII				
41	E-23	20	54	
42	F-25	20	64	
43	E-25	20	56	
44	D-25	20	51	
45	D-24	20	43	
46	C-24	20	56	
47	SW-5/C	20	44	
48	C'-25	20	55	
ZONE-VIII				
49	F-28	20	60	
50	28-E-29	20	34	
51	C-15	20	46	
52	C-17	20	47	
53	E-27	20	46	
54	C-19	20	46	
55	B-29	20	48	
56	A43-C-30	20	45	
57	E-30	20	60	
58	I-28	20	50	
59	H-28	20	40	
60	C-29	20	45	
61	E'-30	20	60	
ZONE-IX				
62	J-28	20	52	
63	K-29	20	40	
64	SW-7/A	20	48	
65	L-31	20	52	
66	M-30	20	37	
67	M-28	20	44	
68	M-26	20	41	

69	25-L-26	20	50	Hollow
70	L-26	20	60	
71	RCC stair wall	20	55	

HEAD OFFICE BUILDING,NABARD,BKC,MUMBAI.			
PROFOMETER SCAN RESULTS (GROUND TO TERRACE FLOOR)			
Sr. No.	**R.C.C. Member**	**Diameter of Bar (mm)**	**Cover Concrete (mm)**
GROUND FLOOR (A-Wing)			
1	J-5	20	63
2	J-6	20	65
3	J-7	20	63
GROUND FLOOR (B-Wing)			
4	E-11	20	65
5	D-11	20	65
GROUND FLOOR (D-Wing)			
6	E-24	20	45
7	D-24	20	50
GROUND FLOOR (E-Wing)			
8	J-27	20	51
9	J-28	20	54
FIRST FLOOR (CANTEEN)			
10	K-20	20	55
11	K-19	20	58
12	J-30	20	59
13	SH	20	60
14	SH-2	20	65
SECOND FLOOR (A-Wing)			
15	J-7	20	40
16	J-6	20	43
SECOND FLOOR (B-Wing)			
17	E-11	20	35
18	E-12	20	40
SECOND FLOOR (C-Wing)			
19	E-15	20	47
20	E-16	20	36
21	E-19	20	41
SECOND FLOOR (D-Wing)			

CONCRETE CORE TEST RESULTS

PROJECT NAME: NABARD OFFICE BUILDING, BKC , BANDRA (EAST), MUMBAI-400051

CORE TEST RESULTS

Sr. No	Structure	Core Identification	dia, d, mm	length, h, mm	h/d	Failure Load, kN	Core Strength, MPa	Corr Factor as per IS-516	Corr Factor for Eqv.150 mm Cube Strength, as per IS 516	Final Eqv.150 mm Cube Strength, Mpa
1	Column	C-7,ZONE-IV	67.27	114.39	1.70	61	17.17	0.97	1.25	20.73
2	Column	J-5,ZONE-I	68.23	113.25	1.66	103.6	28.34	0.96	1.25	34.07
3	Column	F-10,ZONE-V	67.43	103.09	1.53	75.9	21.25	0.95	1.25	25.16
4	Column	A-11,ZONE-V	67.51	96.82	1.43	49.8	13.91	0.94	1.25	16.3
5	Column	E-19,ZONE-VI	67.41	115.83	1.72	95.1	26.65	0.97	1.25	32.31
6	Column	J-2A,ZONE-I	68.82	117.34	1.71	36	9.68	0.97	1.25	11.74
7	Column	E-11,ZONE-V	67.45	114.82	1.70	27.4	7.67	0.97	1.25	9.26
8	Column	C-17,ZONE-VI	67.53	117.43	1.74	95.2	26.58	0.97	1.25	32.36
9	Column	C-19,ZONE-VI	67.44	109.33	1.62	40.6	11.37	0.96	1.25	13.64
10	Column	E-17,ZONE-VI	67.22	105.05	1.56	41.5	11.69	0.95	1.25	13.87
11	Column	C-15,ZONE-V	67.32	106.25	1.58	37	10.39	0.95	1.25	12.34
12	Column	D-11,ZONE-V	67.46	121.09	1.79	83.3	23.31	0.98	1.25	28.49
13	Column	E-25,ZONE-VII	67.33	115.08	1.71	53.9	15.14	0.97	1.25	18.28
14	Column	E-24,ZONE-VII	67.49	113.93	1.69	54.7	15.29	0.97	1.25	18.46
15	Column	B-18,ZONE-VII	67.49	117.42	1.74	32	8.95	0.97	1.25	10.89
16	Column	F-9,ZONE-III	68.02	108.54	1.60	54.3	14.94	0.96	1.25	17.88
17	BEAM	4-M-5,ZONE-I	68.22	113.32	1.66	127.6	34.91	0.96	1.25	41.98
18	Column	J-8,ZONE-II	68.01	112.22	1.65	59.6	16.41	0.96	1.25	19.73
19	Column	L-5,ZONE-I	68.15	102.4	1.50	82.3	22.56	0.95	1.25	26.65
20	Column	D-4,ZONE-IV	67.96	112.28	1.65	21	5.79	0.96	1.25	6.96

21	Column	K-7,ZONE-II	67.97	110.36	1.62	40.9	11.27	0.96	1.25	13.49
22	Column	J-6,ZONE-II	68.21	116.24	1.70	65.2	17.84	0.97	1.25	21.54
23	Column	C-4,ZONE-IV	67.94	113.53	1.67	32.6	8.99	0.96	1.25	10.84
24	Column	D-2,ZONE-IV	67.96	112.22	1.65	61.3	16.9	0.96	1.25	20.32
25	Column	J-7,ZONE-II	68.26	110.47	1.62	58	15.85	0.96	1.25	19.02
26	Column	I-7,ZONE-II	68.24	113.1	1.66	61	16.68	0.96	1.25	20.06
27	Column	F-6-E,ZONE-III	68.17	115.67	1.70	37.7	10.33	0.97	1.25	12.47
28	Column	6-E-7,ZONE-II	67.85	113.96	1.68	61.9	17.12	0.98	1.25	20.89
29	Column	F-2,ZONE-III	68.12	107.8	1.58	63.5	17.43	0.95	1.25	20.69
30	Column	C-3,ZONE-IV	67.38	112.87	1.68	60.1	16.85	0.96	1.25	20.31
31	RCC WALL	SW-4/E,ZONE-V	67.37	115.87	1.72	61.8	17.34	0.97	1.25	21.02
32	RCC WALL	SW-2/A,ZONE-I	67.41	118.97	1.76	87.6	24.54	0.97	1.25	29.88
33	RCC WALL	SW-3/A,ZONE-V	68.68	110.68	1.61	62.8	16.95	0.96	1.25	20.28
34	Column	F-7,ZONE-III	68.02	107.06	1.57	57.4	15.8	0.95	1.25	18.76
35	Column	B-23,ZONE-VII	67.45	111.34	1.65	103.7	29.02	0.96	1.25	34.9
36	Column	F-25,ZONE-VII	67.43	95.59	1.42	54.8	15.34	0.94	1.25	17.97
37	Column	K-28,ZONE-IX	67.15	86.55	1.29	64.3	18.16	0.93	1.25	21.02
38	Column	C-15,ZONE-VIII	67.54	103.63	1.53	84.5	23.58	0.95	1.25	27.92
39	Column	M-31,ZONE-IX	67.41	110.15	1.63	73.1	20.48	0.96	1.25	24.58
40	Column	28-C-29,ZONE-VIII	65.01	120.19	1.85	105.4	31.76	0.98	1.25	39.02
41	Column	B-25,ZONE-VII	67.58	80.17	1.19	93.7	26.12	0.92	1.25	29.88
42	Column	F-28,ZONE-VIII	67.21	79.82	1.19	95.7	26.98	0.92	1.25	30.86
43	Column	D-25,ZONE-VII	67.46	82.13	1.22	95.4	26.69	0.92	1.25	30.6
44	RCC WALL	SW 5/C,ZONE-VII	67.52	104.21	1.54	74.8	20.89	0.95	1.25	24.78
45	RCC WALL	SW 7/B,ZONE-IX	67.41	115.47	1.71	79.5	22.28	0.97	1.25	26.9
46	RCC WALL	SW 6/B,ZONE-VII	67.44	113.74	1.69	91.5	25.62	0.97	1.25	30.93

47	Column	J-29,ZONE-IX	67.07	117.91	1.76	36.9	10.44	0.97	1.25	12.72
48	Column	F-17,ZONE-VII	67.13	110.24	1.64	72.5	20.49	0.96	1.25	24.64
49	Column	I-28,ZONE-VIII	67.36	120.18	1.78	66	18.52	0.98	1.25	22.6
50	Column	L-25,ZONE-IX	67.16	112.26	1.67	58.5	16.52	0.96	1.25	19.9
51	Column	M-25, ZONE-IX	43.64	81.16	1.86	26	17.38	0.98	1.25	21.36
52	BEAM	B-1, ZONE-IX	43.7	83.82	1.92	14.9	9.94	0.99	1.25	12.28
53	Column	LC-20/LB	43.9	70.7	1.61	13.5	8.92	0.96	1.25	10.67
54	Column	LC-20/LB	43.21	86.04	1.99	27.8	18.96	1	1.25	23.69
55	Column	C-19,ZONE-VIII	43.2	78.18	1.81	14.3	9.75	0.98	1.25	11.93
56	Column	C-1,ZONE-IX	43.8	86.11	1.97	18.9	12.54	1	1.25	15.6
57	Column	LC-23/LB	43.91	86.94	1.98	26.3	17.37	1	1.25	21.6
58	BEAM	B-2,CANTEEN	43.92	79.08	1.80	23.8	15.71	0.98	1.25	19.2
59	BEAM	J`-28-K` ZONE-VIII	43.05	86.22	2.00	16.1	11.06	1	1.25	13.83
60	Column	D-29,ZONE-VIII	43.15	86.42	2.00	15.7	10.73	1	1.25	13.42
61	Column	C-1,CANTEEN	43.11	68.2	1.58	14.2	9.73	0.95	1.25	11.55
62	Column	LC-25,ZONE-IX	43.92	86.04	1.96	12.6	8.32	0.99	1.25	10.31
63	Column	C-3, CANTEEN	43.91	85.1	1.94	26.6	17.57	0.99	1.25	21.78
64	Column	LC-22/LB	43.91	85.42	1.95	18.8	12.42	0.99	1.25	15.39
65	Column	M-29, ZONE-IX	43.83	80.58	1.84	19.5	12.92	0.98	1.25	15.88
66	Column	LC-12/LB	43.81	80.77	1.84	16.2	10.75	0.98	1.25	13.21
67	Column	LC-19/LB	43.89	84.52	1.93	17.2	11.37	0.99	1.25	14.05
68	Column	LC-24/LB	43.22	86.49	2.00	28.4	19.36	1	1.25	24.19
69	BEAM	B-2,ZONE-IX	43.2	85.14	1.97	13	8.87	1	1.25	11.03
70	Column	C-2, CANTEEN	43.94	78.17	1.78	18.9	12.46	0.98	1.25	15.2
71	Column	M-27, ZONE-9	43.78	85.42	1.95	11.1	7.37	0.99	1.25	9.14
72	Column	F-28,ZONE-VIII	43.41	86.4	1.99	18.6	12.57	1	1.25	15.71
73	BEAM	B-1, CANTEEN	43.1	80.94	1.88	18.5	12.68	0.99	1.25	15.61
74	Column	F-10, TERRACE	67.68	116.21	1.72	163.2	45.37	0.97	1.25	55.01
75	Column	C-11, TS	67.2	116.94	1.74	83	23.4	0.97	1.25	28.5
76	Column	C-14, TS	67.2	80.72	1.20	144.1	40.63	0.92	1.25	46.47
77	Column	E-2, TS	67.83	99.22	1.46	62.1	17.19	0.94	1.25	20.24
78	Column	D-2,TS	67.25	87.92	1.31	90.4	25.45	0.93	1.25	29.46
79	Column	LC-	43.2	80.4	1.86	16.5	11.26	0.99	1.25	13.86

		25,ZONE-IX								
80	BEAM	B-8, E-WING	67.43	86.95	1.29	64.3	17.79	0.92	1.25	20.53
81	BEAM	J-8-K, E WING	43.53	68.54	1.57	12.9	8.67	0.95	1.25	10.29
82	BEAM	J-6-K, E WING	43.74	86.7	1.98	31.4	20.9	0.995	1.25	25.99
83	BEAM	19-F-20	43.46	67.2	1.55	51.2	34.52	0.949	1.25	40.94
84	BEAM	B-10, A WING	43.74	79.83	1.83	25.7	17.1	0.98	1.25	20.95
85	COLUMN	K-7-E	43.44	77.68	1.79	27.3	18.42	0.978	1.25	22.52
86	COLUMN	E-19	43.52	72.83	1.67	18.8	12.64	0.964	1.25	15.23
87	BEAM	ZONE-1, B-2	43.7	83.72	1.92	29.9	19.93	0.989	1.25	24.64
88	COLUMN	J-8, E WING	42.81	81.4	1.90	39.4	27.37	0.987	1.25	33.77
89	BEAM	J-5-K, E-WING	43.11	75.1	1.74	17.2	11.78	0.974	1.25	14.35
90	BEAM	E-20-F	44.06	75.08	1.70	7.2	4.72	0.966	1.25	5.7
91	BEAM	ZONE-1, B-2	43.86	81.09	1.85	11.2	7.41	0.983	1.25	9.11
92	BEAM	ZONE-3, F-AP10-AP	43.11	81.11	1.88	9.8	6.72	0.985	1.25	8.27
93	BEAM	B-30	43.22	68.39	1.58	13.3	9.07	0.95	1.25	10.77
94	BEAM	B-6, ZONE-3	43.47	75.45	1.74	38.3	25.81	0.974	1.25	31.42
95	Column	F-18	44.22	78.41	1.77	43.3	28.2	0.976	1.25	34.4
96	BEAM	B-4, ZONE-3	43.42	66.73	1.54	23.5	15.87	0.949	1.25	18.83
97	Column	E-17	43.22	74.12	1.71	13.2	9	0.966	1.25	10.86
98	Column	LC-14	43.85	71.52	1.63	37.6	24.89	0.96	1.25	29.87
99	BEAM	B-12,ZONE-9	43.8	86.02	1.96	25.6	16.99	0.995	1.25	21.13
100	BEAM	B-2,ZONE-4	43.42	79.47	1.83	13	8.78	0.98	1.25	10.76
101	BEAM	B-2, ZONE-3	43.43	68.74	1.58	35.2	23.76	0.95	1.25	28.21
102	BEAM	B-1,ZONE-3	43.49	78.61	1.81	14	9.42	0.978	1.25	11.52
103	BEAM	D-20	43.82	73.27	1.67	36.2	24.01	0.964	1.25	28.93
104	BEAM	B-1,ZONE-4	43.09	74.2	1.72	9.4	6.45	0.97	1.25	7.82
105	BEAM	B-4, ZONE-4	43.41	83.12	1.91	25.9	17.5	0.987	1.25	21.59
106	BEAM	B-5,ZONE-4	43.82	84.02	1.92	20.2	13.39	0.989	1.25	16.56
107	BEAM	B-3,ZONE-4	43.8	78.71	1.80	18.1	12.01	0.978	1.25	14.69
108	BEAM	B-6,ZONE-4	43.75	80.11	1.83	13.2	8.78	0.98	1.25	10.76
109	BEAM	B-3,ZONE-3	43.8	75.39	1.72	13.6	9.03	0.97	1.25	10.95
110	BEAM	B-5,ZONE-3	43.73	83.18	1.90	8.6	5.73	0.987	1.25	7.06
111	BEAM	B-2,ZONE-5	43.83	59.02	1.35	24.3	16.1	0.931	1.25	18.74
112	Column	J-5	43.82	71.99	1.64	23.5	15.58	0.962	1.25	18.74
113	Column	LC-15	43.42	72.82	1.68	0.234	15.87	0.964	1.25	19.12
114	Column	LC-17	43.42	56.82	1.31	28.4	19.18	0.926	1.25	22.2
115	Column	LC-2	43.8	55.84	1.27	22.9	15.2	0.923	1.25	15.53
116	Column	LC-1	43.84	61.72	1.41	24.6	16.3	0.935	1.25	19.05
117	Column	D-19	43.2	64.34	1.49	22.9	15.62	0.945	1.25	18.45
118	Column	D-20	43.81	60.03	1.37	25.7	17.05	0.934	1.25	19.91

ANALYSIS OF N.D.T. RESULTS:

A. FOR BASEMENT TO LOWER BASEMENT:-

Rebound Hammer readings for **columns & Shear wall** indicate an average compressive strength of **30.2Mpa**& average ultrasonic pulse velocity of **2.59km/sec.**

Rebound Hammer readings for **beams** indicate an average compressive strength of **31.5Mpa**& average ultrasonic pulse velocity is **1.58 km/sec.**

Rebound Hammer readings for **slab** indicate an average compressive strength of **30.0Mpa**& average ultrasonic pulse velocity is **1.17km/sec.**

Carbonation for RCC members has reached to an average depth of **68.10mm**.

Half-cell potentiometer indicates the probability of corrosion near to **5-50%.**

B. FOR GROUND TO TERRACE FLOOR:-

Rebound Hammer readings for **columns & Shear wall** indicate an average compressive strength of **36.2Mpa**& average ultrasonic pulse velocity is **1.69km/sec.**

Rebound Hammer readings for Beams& Slabs indicate an average compressive strength of **35.0Mpa**& average ultrasonic pulse velocity is **1.22km/sec.**

Carbonation for RCC members has reached to an average depth of **51.57mm.**

Half-cell potentiometer indicates the probability of corrosion near to **5-50%.**

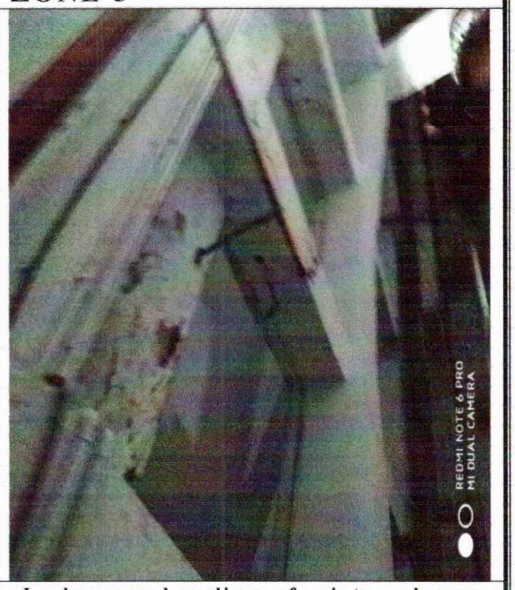
C. Core Test Result:

Core Test results show an equivalent cube compressive strength of **20.14MPa** for columns, beams, slabs & shear wall.

The interpretation of the NDT results and the correlation of the results with the strength of the concrete are as per the extensive research carried out by us.

BASEMENT ZONE-3

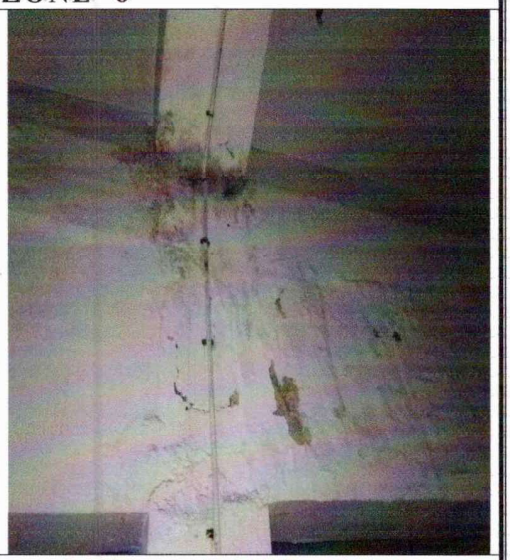
Cracks & bulging of plaster at beams.



Leakages and peelings of paints on beams.

BASEMENT ZONE- 6

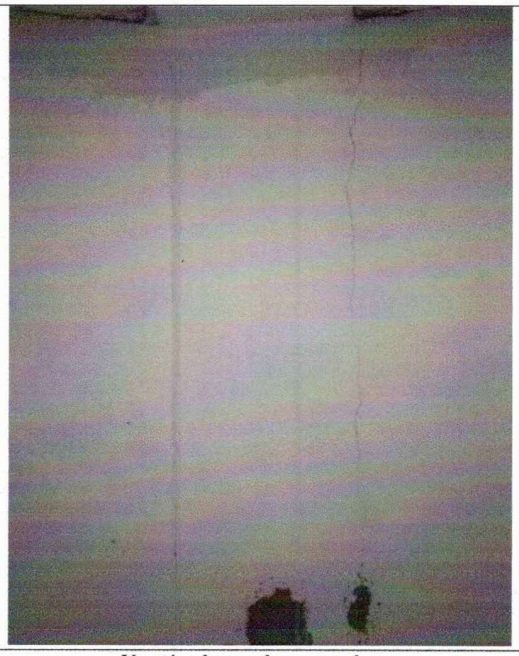
Leakages marks on beam and column.



Peeling paints, bulging of plaster.

BASEMENT ZONE-7

Leakages marks on column.



Vertical cracks on column.

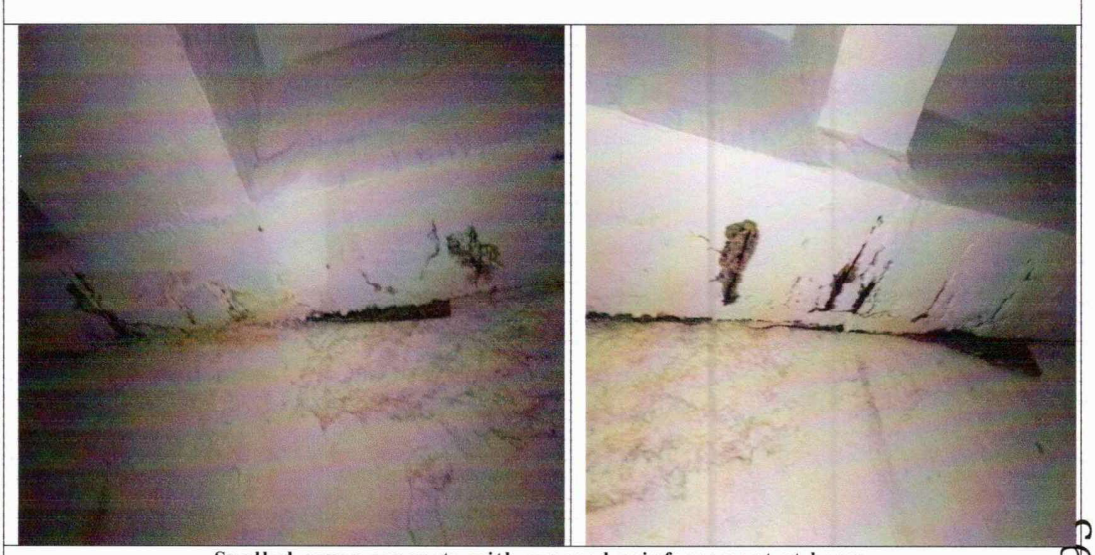
Leakages on beam and peelings of paint.

BASEMENT ZONE-9

Leakages, exposed reinforcement at expansion joint beam, separation crack at column.

BASEMENT ZONE-4

Bulging of slab plaster with cracks.

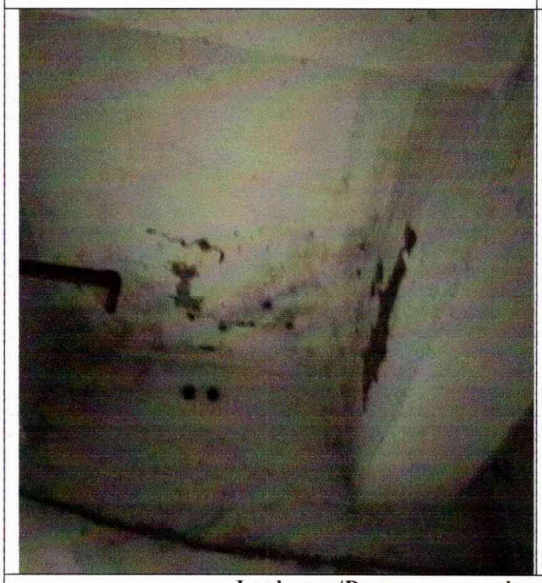


Spalled cover concrete with exposed reinforcement at beam.

BASEMENT ZONE-5

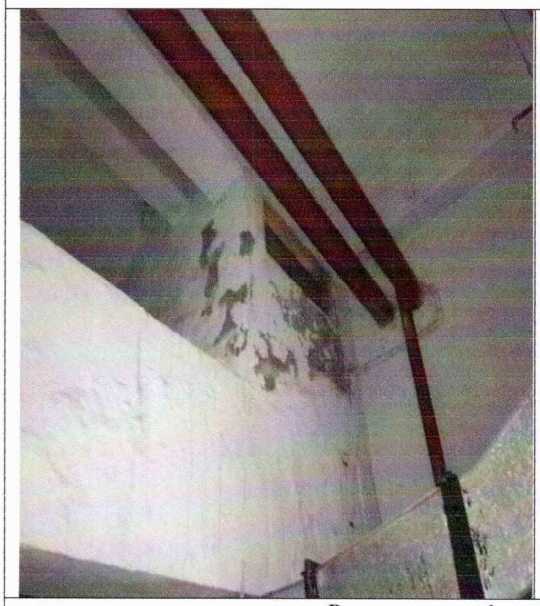
Spalled cover concrete with heavily exposed reinforcement at beam.

Dampness marks on slabs.



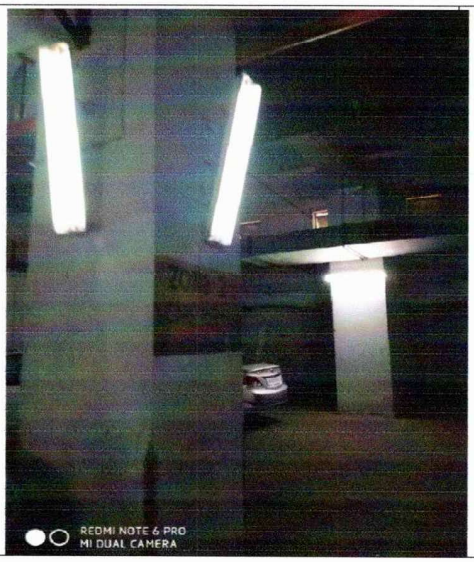
Leakages/Dampness marks on slab, peelings of paint.

BASEMENT ZONE-8

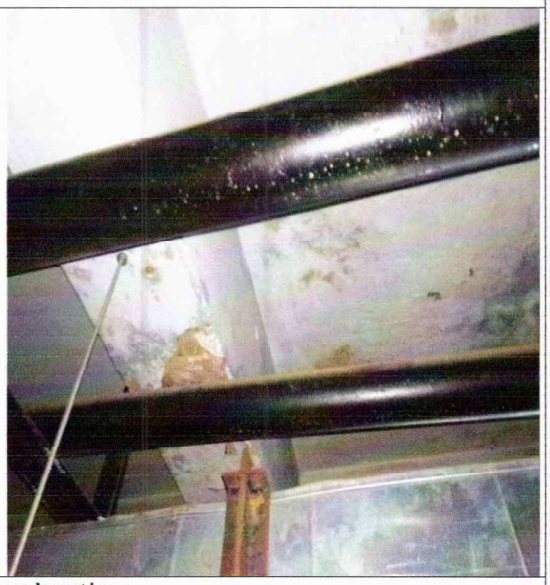


Dampness marks on column, beam.

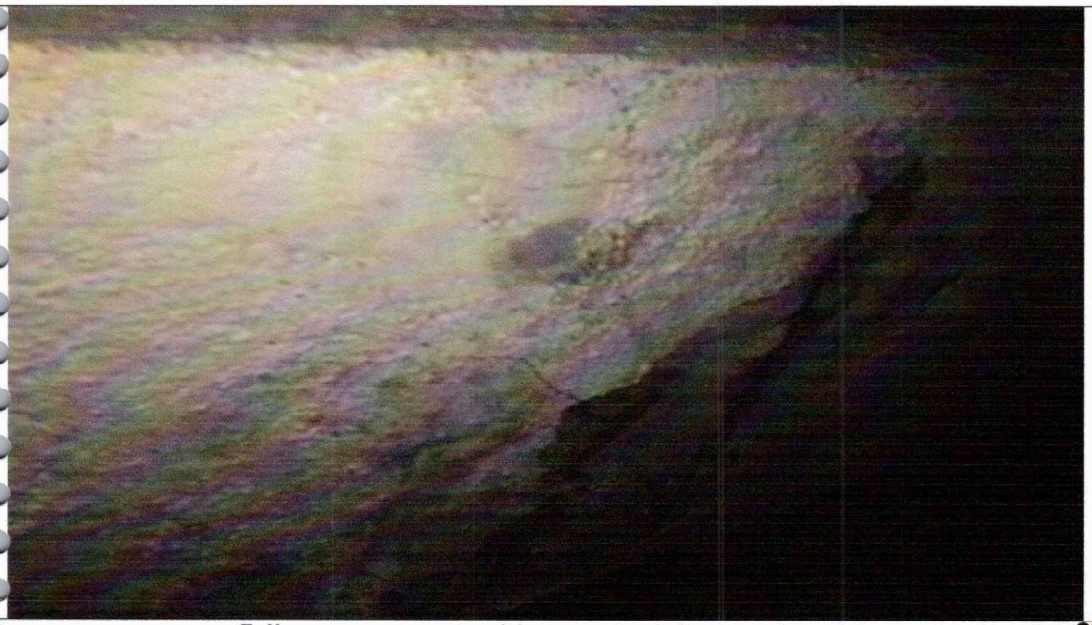
BASEMENT ZONE-2



BASEMENT ZONE-1

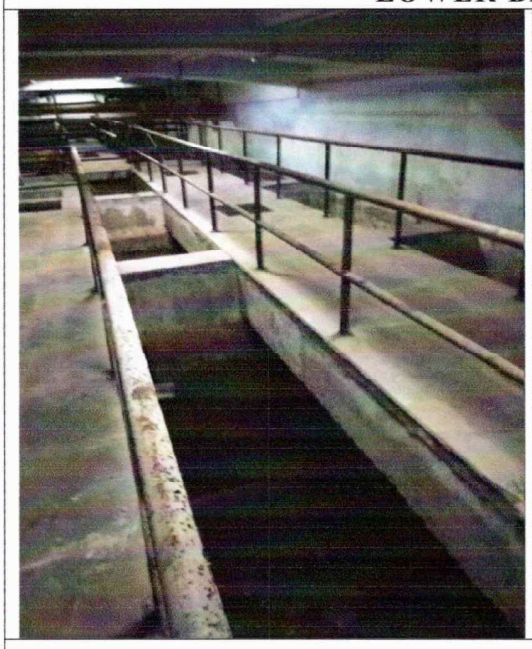


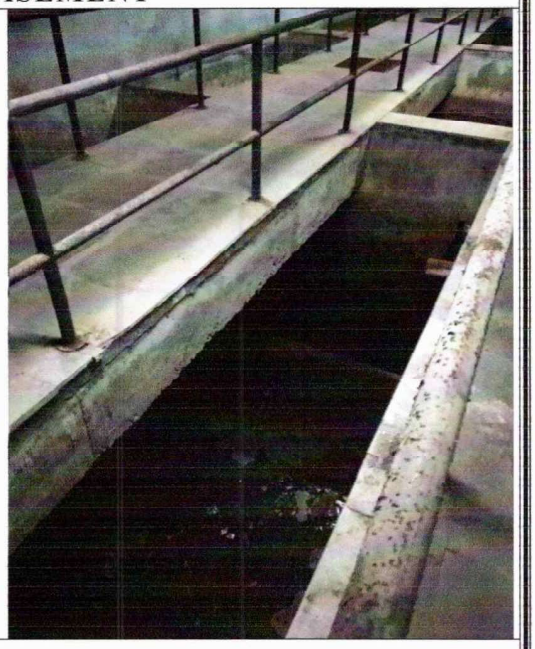
Leakages at many locations.

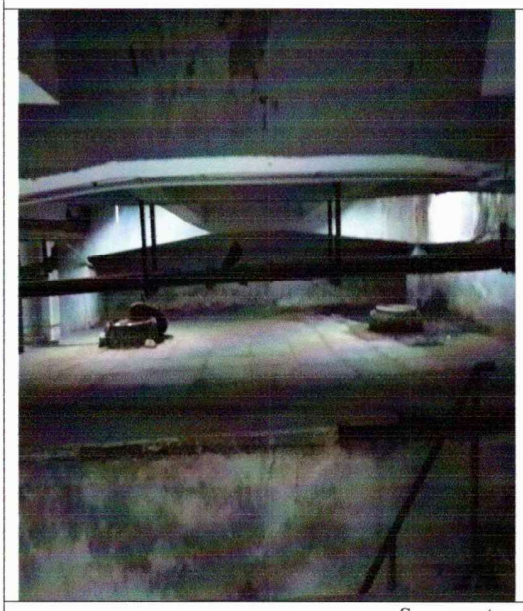


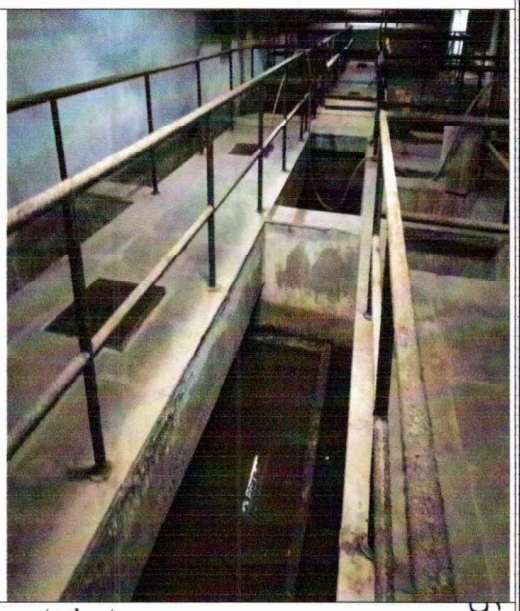
Fallen cover concrete with exposed reinforcement on slab.

LOWER BASEMENT









Sewage treatment plant.

CONCLUSION
AND
RECOMMENDATIONS

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CONCLUSION:

The **"NABARD HEAD OFFICE BUILDING"** at BKC is 2 basements (lower and upper basements) + G+8 upper floors, RCC framed structure. The structure is constructed in the year 2001 i.e. 18 years old.

The detailed visual inspection along with Non Destructive Tests & semi-destructive test were carried out to assess the condition of the building. The columns, beams and slabs were deteriorated at several locations with minor cracks & bulged cover concrete at basement. Peeling of paints at some locations were observed at basement. Fallen cover concrete of slabs and exposed reinforcement at several locations were observed. Minor cracks on few columns & beams were observed. Heavy dampness marks observed mainly at internal side of retaining walls, beams and slabs etc.

The expansion joints at upper & lower basement of the building were exposed and are showing leakages which needs to be repair by using the items suggested in attached BOQ or equivalent to that.

The leakages due to plumbing have been observed at few locations which need to be repair or replaced. Mosaic tiles for waterproofing at terrace were observed in distress condition which needs to be replaced with new waterproofing treatment.

From the above mentioned observation we understand that, the box type water proofing has not been carried out while constructing the basement area which in turn has resulted in the seepage / leakages .The STP (Sewage Treatment Plant) plant situated at lower basement area is also not recommended, which is also one of the reason. While constructing the basement it seems that adequate precautions were not taken while sealing the construction joints. Seepages through retaining walls at lower basement, slabs at upper basement were observed and is recommended for repair by using flexible leak sealing PU foam resin (very low viscous) material.

Results of the various NDT/SDT tests and the visual survey were combined to conclude the quality of the concrete. Rebound Hammer Test results indicate **good** in-situ strength of the concrete. Ultra sonic pulse velocity shows that in-situ quality of the concrete is of **doubtful** quality with loss of integrity in RCC elements. The carbonation test has reached to the average depth of **68.10 mm for basement and lower basement and 51.57 mm for ground to eight floors**. Half cell potentiometer test indicates the probability of corrosion is near to **5 to 50%.**

The RCC members' beams and slabs are covered with false ceilings and columns are covered with paneling, due to which it is not possible to visualize the whole surfaces of the RCC members. As per the tender requirement we carried out 20-

25% of the covered area (Panel, False Ceiling etc.), but this quantity of the area is very less as compared to the whole covered area of the structure, therefore the assessments from visual survey and NDT/SDT tests the results may varies for the covered area therefore the accurate evaluation of the structure is not predicted.

Core results of some of the RCC members were very low which may due to the improper batching & poor workmanship, they needs to be strengthened. The methodology and suggested strengthening items are attached in BOQ.

However, we are in the conclusion that, the structural repair should be carried out immediately to avoid further deteriorations of RCC members. If adequate structural repair, strengthening & rehabilitation measures are undertaken as per BOQ enclosed herewith, the structure can be rehabilitated to required service level for gravity loads by incurring at reasonable cost.

Note:

- ✓ It is further recommended to remove all the false ceiling, wooden or any other material paneling to columns, beams and slabs etc or on any other structural members.
- ✓ The Estimate includes only Retrofitting / Structural Repair items. After tabulating the analytical data of NDT Tests, Visual Inspection & by virtue of our experience and expertise in the field of Retrofitting / Structural Repairs of the quantity are calculated in Bill of quantity of items. It may vary after actual Plaster / concrete chipping.
- ✓ For Additional safety, remove the loosened concrete to avoid accidents.
- ✓ The Bill of Quantity does not contain the items required for renovation work after retrofitting / structural repairs such as replacing Granite framing, aluminum / Wooden windows, doors, flooring, civil, plumbing, electrical etc.
- ✓ The retrofitting / strengthening work should be carried out by experienced contractor in this field under supervision of retrofitting / structural repair consultant.

S.P. BAGWE CONSULTANTS PVT. LTD. MUMBAI

PROPOSED LINE OF ACTION

The total scope of repair shall be broadly classified under following categories.

1. The elements where the affected area is more than 50% of total surface area.
2. The elements where the damage is isolated with area less than 50% of total surface area.
3. The elements where no concrete delaminating is present but severe cracks have formed along the length.
4. Protection system to all external faces including roofs and walls to prevent ingress of moisture, impurities and unwanted gases in future.

For Category 1, the repairs shall be carried out after fixing the formwork surrounding the element and filling the same with pre-packed dual shrinkage compensated, free-flow, cementitious micro concrete.

For Category 2, the repairs shall be carried out with dual shrinkage compensated, high strength, single component, pre-packed cementitious repair mortar by hand application and finishing with trowel.

For Category 3, the cracked sections shall be grouted with super low viscous epoxy material under pressure in the prefixed injection ports after sealing the cracks with epoxy mortar.

For Category 4, the elements exposed to atmosphere viz., Roofs, External columns, beams and walls shall be given protection system that resists ingress of moisture and external impurities that lead to corrosion.

The exposed horizontal members like roofs, balconies, terraces etc. shall be given protection system consisting of integral cement based waterproofing treatment including preparation of surfaces that can be applied by laying, spray, trowel, squeeze or roller.

The exposed vertical members like walls, column and beam faces shall be given protection system consisting of single component, high performance acrylic resin based coating for long term protection of concrete & masonry from aggressive atmospheric gases such as, carbon

dioxide, sulphur dioxide and chloride ions, that can be applied by spray, brush or roller.

Though the systems mentioned above are best suitable for the problems identified, it is imperative to follow systematic procedure with quality controlled materials for application of the same to get maximum efficacy.

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METHODOLOGIES FOR REPAIRS:

Category 1: Large Area Repairs:

The distressed elements where the area of damage is large viz., beams and columns having damaged area of more than 50% of total surface area or having two sides damaged and Slabs having area more than 1 sq.m. damaged shall be repaired with single component, dual shrinkage compensated micro concrete. The steps involved in application are:

1. Surface Preparation.
2. Reinforcement Protection.
3. Application of Corrosion Inhibitor
4. Provision of Shear Connectors.
5. Provision of Additional Reinforcement.
6. Application of Bonding Agent.
7. Refurbishment of damaged area.
8. Curing the Damaged area.

1. Surface Preparation:

The elements that require repairs shall be identified and marked. The weak dilapidated concrete cover surrounding the elements shall be chipped and removed. The depth cutting of concrete shall extend beyond the longitudinal steel by at least 10mm. The exposed core concrete shall be mechanically abraded to remove all loose material, followed by intense cleaning with clean, potable water to get rid of all organic impurities. Before proceeding further, it is to be confirmed that the concrete affected by carbonation was completely removed.

2. Reinforcement Protection:

The existing steel bars shall be mechanically abraded to remove all loose rust, scales and other corrosion products. The cleaned bars shall be checked for loss of cross section. The bars whose cross sectional area was reduced by more than 25% shall be retrofitted with new bars of same diameter.

Both the new and existing bars shall be given anti-corrosive treatment by applying two coats of alkaline rust convertor Feovert followed by two coats of anti corrosive rust passivator IPNet RB (CSIR/CBRI)

3. Application of Corrosion Inhibitor:

The prepared concrete substrate shall be given two coats of bipolar concrete penetrating corrosion inhibitor of MANUFACTURER make EPCO-KP-100 or equivalent make at a consumption rate of 500 ml per sq.m for two coats. The corrosion inhibitor shall be applied to the prepared substrate using brush or knap sack spray to cover the entire area. The first coat shall be allowed to penetrate deeply before applying the second coat.

4. Provision of Shear Connectors:

The damaged area shall be provided with 'L'shaped shear connectors using 8mm diameter HYSD bars. The shear connectors are fixed at a distance of 250mm c /c and at locations as directed by structural engineer. The shear connectors are fixed by drilling holes of 12mm diameter into the concrete up to a minimum depth of 75mm using heavy duty drill machine. The drilled holes are cleared of any loose material followed by fixing with epoxy based anchoring system of MANUFACTURER make EPCO-1010 Grout or equivalent make. The shear connectors are driven into the grouted holes and held for few minutes to make them fix in position.

5. Provision of Additional Rebar's:

The reinforcement bars that have lost large cross sectional areas and / or completely corroded shall be replaced or retrofitted with bars of same diameter. For columns the longitudinal reinforcement shall be anchored into the foundation concrete. For beams the longitudinal reinforcement shall be anchored into the connecting columns. The shear reinforcement for the beams shall be provided by anchoring 'U' shaped bars into the slab at required spacing. All anchoring mentioned here are to be done with epoxy anchoring system of MANUFACTURER make EPCO-1010 Grout or equivalent make.

6. Application of Bonding Agent:

Since the concrete is found to be contaminated with chloride, it is necessary to provide a barrier to the chloride ions to prevent them entering into the repaired area. Thus the prepared parent substrate shall be provided with two component epoxy based bonding agent EPIBOND-21-LP of MANUFACTURER make or equivalent having long pot life by brush. The bonding agent shall be carefully applied in thin layer covering all corners and depressions and avoiding over application. The bonding agent shall remain tacky till the micro concrete is poured.

7. Concrete Refurbishment:

The primed area shall be filled with single component; dual shrinkage compensated micro concrete of MANUFACTURER make MOLITH-MC or

equivalent make after fixing the formwork as per requirement. The formwork shall be made of either plywood or steel. In both the cases, before pouring of micro concrete all probable leakage points shall be sealed using suitable sealing compound. The micro concrete shall be mixed strictly following the w/p ratio mentioned in the datasheets. The mixed micro concrete shall be poured into the formwork from one side of the formwork while gently tapping the sides of the formwork. The mixed material shall be placed into the formwork within 20minutes from the time of application. A hole of 75mm diameter shall be drilled through the slab to enable pouring of concrete into the beams, slabs and top section of concrete. The concrete filling shall be continued till hole is completely closed. The number and location of the pouring holes shall be decided depending on the distance or area to be covered by micro concrete.

8. Curing of Repair: The repaired area shall be given a coat of single component acrylic based curing compound Polycure AC or equivalent make using brush giving a continuous coat.

Category 2: Small Area Repairs:

The damaged elements with area affected being small viz., Beams and Columns having only one side damaged and Slabs having an area of less than 1 Sqm shall be repaired with hand applied, single component, thixotropic mortar MOLITH PMM of MANUFACTURER make or equivalent. The steps involved in the application are:

1. Surface Preparation.
2. Reinforcement Protection.
3. Application of Corrosion Inhibitor.
4. Application of Bonding Agent.
5. Application of Repair mortar.
6. Application of Curing Compound.

1. Surface Preparation:

Loose, delaminated concrete should be removed until the substrate consists of sound concrete. Where corrosion of the reinforcement exists, continue bulk removal along the reinforcing steel and adjacent areas with evidence of corrosion-induced damage that would inhibit bonding of repair materials. Bulk concrete removal should include undercutting the corroded reinforcing steel by approximately 19 mm. The shape of the prepared cavity should be kept as simple as possible–generally square or rectangular in shape. The edges of the patches should be saw cut perpendicular to the surface to a depth of 13 mm to avoid feather edging the repair material. Mechanically abrade the surface to remove residual dust, debris, fractured concrete, and contaminants that prevent

proper bonding. Blowing with oil-free compressed air or alternately, the use of a vacuum, may be appropriate if dust is still present after the blasting. The final surface texture should be rough, with approximately 6 mm amplitude.

2. Reinforcement Protection:

The existing steel bars shall be mechanically abraded to remove all loose rust, scales and other corrosion products. The cleaned bars shall be checked for loss of cross section. The bars whose cross sectional area was reduced by more than 25% shall be retrofitted with new bars of same diameter. Both the new and existing bars shall be given anti-corrosive treatment by applying two coats of alkaline rust convertor Feovert followed by two coats of IP Net RB rust passivator(CSIR/CBRI)

3. Application of Corrosion Inhibitor:

The prepared concrete substrate shall be given two coats of bipolar concrete penetrating corrosion inhibitor of MANUFACTURER make EPCO-KP-100 or equivalent make at a consumption rate of 500 ml per sq.m for two coats. The corrosion inhibitor shall be applied to the prepared substrate using brush or knap sack spray to cover the entire area. The first coat shall be allowed to penetrate deeply before applying the second coat.

4. Application of Bonding Agent:

Since the concrete is found to be infested with chloride, it is necessary to provide a barrier to the chloride ions to prevent them entering into the repaired area. Thus the prepared parent substrate shall be provided with two components, epoxy based bonding agent having long pot life of MANUFACTURER make EPIBOND-21-LP or equivalent make by brush. The bonding agent shall be carefully applied in thin layer covering all corners and depressions and avoiding over application. The bonding agent shall remain tacky till the repair mortar is applied.

5. Concrete Refurbishment:

The primed area shall be filled with single component, shrinkage compensated, fiber reinforced, and thixotropic cementitious repair mortar of MANUFACTURER make MOLITH-PMM or equivalent make. The material with its excellent grab and good binder properties allows application in layers of 50mm in vertical and 25mm in overhead applications. Initially the materi is filled into the cavity by hand carefully compacting the same starting fro centre and moving towards the periphery. The final layer shall be troweled to

make it in line with the existing concrete surface. The material shall be mixed in quantities that can be consumed within ½ hr from the time of mixing.

6. Curing of Repair:

The repaired area shall be given a coat of single component acrylic based curing compound Polycure AC or equivalent make using brush giving a continuous coat.

Category 3: Cracked Sections:

The cracked elements without any indication of concrete getting de-bonded or the core concrete after removal of cover for repair was found to have cracks; the same shall be treated by sealing the cracks with epoxy putty and grouting the same with low viscous epoxy grout. The steps involved in repair of cracks are as follows:

1. Surface Preparation
2. Fixing of Packers
3. Filling of Cracks
4. Grouting of EPCOC-KP-HP-250-SLV or equivalent make

1. Surface preparation:

Clean the concrete surface, 2 cm on either side of the crack to ensure bonding of sealing materials used to seal the crack. Ideally, wire brushes shall be used to make the surface rough. Where the cracks are already filled with some material or concrete is found to be weak immediately next to cracks, the cracks needs to be opened up completely. In any case opening of crack in the form of V with top width of minimum 10mm and depth of at least 10mm would be very ideal to avoid future problems. Normally, a surface sealing of the crack would not help during the injection process. When the crack is cut open, using suitable tools, the muck and mud deposited over a time shall be removed mechanically.

2. Fixing of Packers:

At intervals, install packers of size 12mm diameter along the crack. For fixing the packer, holes of required diameter are drilled into the concrete up to a depth of at least 100mm. The packers are installed into the drilled hole and mechanically tightened to make them remain fixed. The periphery of the packer shall be sealed with epoxy putty of MANUFACTURER make Gold-bond Adhesive or equivalent make.

3. Sealing the Cracks:

The opened crack between two packers shall be sealed with epoxy putty of MANUFACTURER make Gold-bond Adhesive or equivalent make. When mixed, Gold-bond Adhesive achieves a paste type consistency which can be applied with thin metal piece. The material shall be carefully pressed into the crack to fill the entire depth of the crack and troweled at the top making it in line with existing concrete surface. The epoxy putty shall be allowed to set completely before initiating the injection process. This would take typically 4 to 6 hours depending on the ambient temperature.

4. Injection of low viscous Epoxy:

Once the epoxy putty is completely set, the fixed packers shall be injected with two component, low viscous epoxy grout of MANUFACTURER make EPCO-KP-HP-250-SLV or equivalent make. The injection process shall be started from the widest part if it is a horizontal surface or from the lowest point if it is a vertical surface. The pressure to be maintained shall be a minimum of 2kgs/sq.cm. Inject in each port or nipple (keeping all others closed except the next immediate one). When the resin starts issuing out of the next port/nipple, close it and continue injection until the pressure can be maintained. After maintaining the pressure for 1 to 5 minutes to allow for total penetration, close the port and then disconnect the pump. Continue the process until all the ports or nipples are similarly injected. The typical advantage of using packers for this injection is that they have a non-return valve at the mouth which will not allow the injected grout to flow back.

5. Packer Removal:

The injected packer shall be removed by simply cutting it at the line of concrete. The gap formed shall be sealed with two part epoxy putty of MANUFACTURER make Gold-bond Adhesive or equivalent make. The putty shall be allowed to cure before any further treatments.

Category 6: Protective Systems:

For Exposed Vertical faces: The following are the steps involved for application of Concrete Protection system for vertical exposed faces of the building consisting of acrylic based primer Monopol-456-HB-Primer or equivalent make followed by solvent free acrylic based anti-carbonation coating Monopol-456-HB or equivalent make

1. Surface Preparation.
2. Application of Monopol-456-HB-Primer or equivalent makes.

1. Surface preparation:

All surfaces shall be free from oil, grease, friable matter and general surface treatments like curing compounds and formwork release agents. New CS renderings and concrete surfaces shall be allowed to cure for at least 14 days to bring the relative humidity to below 5%. All surfaces shall be cleaned mechanically using approved methods to remove laitance etc., Arises shall be rounded off and surface protrusions shall be ground down mechanically to ensure a smooth substrate. Blow holes and depressions if present on the surface shall be filled with MANUFACTURER make fairing mortar MOLITH FM or equivalent make. If cementitious blow hole filler is used, the filled area must be rubbed back, removing any surface desiccation to expose the original concrete surface.

2. Priming with Monopol-456-HB-Primer or equivalent make:

The prepared surfaces shall be primed with acrylic based primer Monopol-456-HB-Primer or equivalent make. The primer shall be applied by brush or spray at recommended coverage rates. The primer shall be allowed to become dry tack free before over coating with top coat.

Application of Monopol-456-HB or equivalent make: The primed substrates shall be coated with High build, crack bridging, elastomeric, waterproof and anti-carbonation coating of MANUFACTURER make Monopol-456-HB or equivalent make either by brush, roller or airless spray. Monopol-456-HB or equivalent make can be applied directly from its container when using brush or roller. Application should not take place when air borne dust or dirt will contaminate the coating.

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