Tender for Selection of Project Management Consultant for

Water Proofing and related Structural Repair works of Basement Floors in NABARD Head Office, BKC, Mumbai

NABARD

PART 1 – TECHNICAL BID

National Bank for Agriculture and Rural Development
Department of Premises, Security and Procurement
Head Office, Bandra - Kurla Complex
Mumbai-51

(Last Date of submission: 14.30 Hours on 09 January 2020)
NATIONAL BANK FOR AGRICULTURE & RURAL DEVELOPMENT
DEPARTMENT OF PREMISES, SECURITY AND PROCUREMENT,
H.O., MUMBAI

(TENDER FOR SELECTION OF PROJECT MANAGEMENT CONSULTANT(PMC) FOR WATER PROOFING AND RELATED STRUCTURAL REPAIR WORKS OF BASEMENT FLOORS IN NABARD HEAD OFFICE, BANDRA KURLA COMPLEX, MUMBAI)

IMPORTANT DATES

<table>
<thead>
<tr>
<th></th>
<th>Date of Issue of Tender Document</th>
<th>19 December 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Pre-Bid meeting with the Bidders</td>
<td>02 January 2020</td>
</tr>
<tr>
<td>3</td>
<td>Date and Time of submission of Tender</td>
<td>14.30 Hrs, 09 January 2020</td>
</tr>
<tr>
<td>3</td>
<td>Date and Time of Opening of Technical Bid</td>
<td>15.00 Hrs, 09 January 2020</td>
</tr>
<tr>
<td>4</td>
<td>Date and Time of Opening of Price Bid</td>
<td>Will be communicated after evaluation of Technical Bid</td>
</tr>
</tbody>
</table>

Name of the Bidder

Contact Number

Address for Correspondence

E-Mail ID
<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>PART/SUBJECT</th>
<th>PAGE No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Part - I - A; Technical Bid (Form of Tender)</td>
<td>4-5</td>
</tr>
<tr>
<td>2</td>
<td>Part - I - B; Technical Bid</td>
<td>6-16</td>
</tr>
<tr>
<td>3</td>
<td>Proforma - Information about Consultant</td>
<td>17-18</td>
</tr>
<tr>
<td>4</td>
<td>Statement – I, II and III</td>
<td>19-21</td>
</tr>
<tr>
<td>5</td>
<td>Annexure – A; Articles of Agreement</td>
<td>22-27</td>
</tr>
<tr>
<td>6</td>
<td>Annexure – B; Indemnity Bond</td>
<td>28-29</td>
</tr>
<tr>
<td>7</td>
<td>Appendix – Report and Repair Methodology Suggested by IIT Bombay</td>
<td>30-34</td>
</tr>
<tr>
<td>8</td>
<td>PART – II; Price Bid</td>
<td>35-36</td>
</tr>
</tbody>
</table>
PART- I A: TECHNICAL BID

TENDER FOR SELECTION OF PROJECT MANAGEMENT CONSULTANT FOR WATER PROOFING AND RELATED STRUCTURAL REPAIR WORKS OF BASEMENT FLOORS IN NABARD HEAD OFFICE, BKC, MUMBAI

FORM OF TENDER

The Chief General Manager
Department of Premises, Security & Procurement (DPSP)
National Bank for Agriculture and Rural Development
C-24, G-Block, BKC, Bandra(E)
Mumbai - 51

Dear Sir,

Having examined the tender documents for “TENDER FOR SELECTION OF PROJECT MANAGEMENT CONSULTANT FOR WATER PROOFING AND RELATED STRUCTURAL REPAIR WORKS OF BASEMENT FLOORS IN NABARD HEAD OFFICE, BKC, MUMBAI” at NABARD H.O., C-24, G-Block, BKC, Bandra (E) 400 051; and having understood the provisions of the tender documents, having thoroughly studied the requirements, I/We submit herewith the tender offer to you for the Project Management Consultant in accordance with the terms and conditions and within the time mentioned in the tender documents at the price quoted by me/us in the “Price Bid Form” submitted separately duly signed in a sealed cover as desired in the tender. I/We enclose with tender, the following duly signed documents namely:-

a) Notice Inviting Tender
b) Part I - B: Technical Bid Information about tenderer (Along with all documentary proof).
c) Appendix
d) Price Offered (Financial Bid)- In separate sealed cover.

I/We hereby undertake that the statements made herein and the information given in the document are true in all respect and that in the event of any such statement or information being found to be incorrect in respect of any particulars, the same may be construed to be a misrepresentation entitling NABARD to avoid any resultant contract / to terminate the contract and will compensate the NABARD for any loss/damage caused due to such misrepresentation and NABARD may also, at its discretion entitled to Blacklist the Bidder. I/We confirm having deposited/credited Rs. 10,000/- (Rupees Ten Thousand Only) to NABARD Current A/c as mentioned in the tender document towards Earnest Money which does bear any interest and Non-refundable Tender Fee of Rs. 500/- (Rupees Five Hundred Only).

1. Our Banker’s are :

i)
ii)

2. The names of partners of our firm are (If applicable):
   i)
   ii)
   iii)

Name of the partner of the firm
Authorized to sign:

OR
Name or person having Power of
Attorney to sign the contract
(certified copy of the Power of
Attorney should be attached):

Yours faithfully,

(Signature with date of Authorized Signatories)
Name/s -
Designation/s -
Seal –
PART-I B: TECHNICAL BID

TENDER FOR SELECTION OF PROJECT MANAGEMENT CONSULTANT FOR WATER PROOFING AND RELATED STRUCTURAL REPAIR WORKS OF BASEMENT FLOORS IN NABARD HEAD OFFICE, BKC, MUMBAI

A. Eligibility Criteria of the consultants/Agencies/Firms/applicants:

1. The applicants should be qualified Civil Engineers/Structural Engineers.

2. The firm should have in-house technical professionals in the field of Waterproofing/ Civil and Structural Engineering/Construction Chemical Technology and whose details should be provided as per the proforma attached in the Technical Bid.

3. The firm should have at least an experienced Site Engineer having Degree in Civil Engineering with minimum 2 years of professional experience or 3 year Diploma in Civil Engineering with minimum 3 years of professional experience specifically for this work at site as whole day basis for day to day supervision and whose self attested Bio-Data, copy of photo ID, copy of proof of qualifications and experiences should be submitted with the Technical Bid.

4. The firm should have applicable Registrations (including tax registrations viz., GST and PAN, etc.)

5. The firm should have a current / savings bank account with a scheduled commercial bank. A cancelled cheque leaf to be submitted and details of Bank/Branch/IFSC /Account no. to be furnished.

6. The firm should have at least 10 years of experience in the field of consultancy in respect of Water Proofing Works/Structural repairs as on 31.05.2019.

7. The firm should have experience and expertise in Non Destructive Tests(NDT) such as Thermography/Infrared Survey, Ground Penetrating Radar (GPR) Survey and Ultrasonic Pulse Velocity(UPV) tests to identify the source of leakages and for precise assessment of the condition of RCC elements.

8. Average Annual turnover of the firm for the last three years ending 31.03.2019 should not be less than Rs 20 lakh.

9. The firm should have undertaken consultancy assignment of Water Proofing / Structural Repair works and completed Water Proofing / Structural Repair works of RCC Buildings during the last 7 years ending 30.11.2019 of at least:
   i) three consultancy assignments with total estimated cost/completed cost of project under an individual assignment should not be less than Rs 20 lakh.
ii) two consultancy assignments with total estimated cost/completed cost of project under an individual assignment should not be less than Rs 25 lakh

iii) one consultancy assignment with total estimated cost/completed cost of project under the assignment should not be less than Rs 40 lakh.

10. Performance of the bidders who have already undertaken/have been carrying out the assignment with NABARD will also be assessed for qualifying the eligibility.

The bidders should submit the certified proof for establishing the above eligibility criteria along with filled in proforma in the Technical Bid. Copies of evidence of pre-qualifications in chronological order, should be submitted in a separate envelope which should be kept in Envelope No.1.

B. Instructions to the consultants/applicants:

i. In deciding the selection of a Consultant, great emphasis will be given on the ability and competence of applicants to render required services within the specified time frame.

ii. Applications containing false and/or incomplete information are liable for rejection.

iii. The applicant must have qualified and experienced professionals in the respective discipline. The consultant should have a separate in-house team of professionals consist of experienced/qualified Civil Engineers, Quantity Surveyors and Drafts men for designing, preparation of drawings, preparation of BoQ, tender documents, field supervision, monitoring, quality control and recording the measurements of quantities of items of work.

iv. The scope of the work is “Consultancy and Project Management Assignment” for Water proofing of Basement floors(Upper basement and Lower basement) and related structural repairs as per the requirement at NABARD, Head Office, Mumbai. Total area of basement floors is approximately 1,00,000 Sqt.

v. The fees/charges for rendering the services as per scope of work shall be quoted by the applicant in the Price bid to be submitted separately in a sealed envelope as Part-II.

vi. Decision of NABARD with regard to determine the selection of the applicant/Consultants shall be final. NABARD is not bound to assign any reasons therefore and reserve the right to reject any or all offers.

vii. Sufficient supporting documents should be furnished to prove the eligibility at Para-A. The consultant should fill the proforma (with Statements–I, II & III) along with the supporting documents.

viii. Price bids of only those applicants/consultants qualified in the Technical bid will be opened for the selection of consultant.
C. Scope of Works (Services to be rendered by the Consultant):
Scope of the consultancy will include the following works:

1. Conducting detailed site investigation, prescribe the Non Destructive Tests and other tests as required to be conducted by the contractor, preparing estimation, BoQ, specifications & tender documents, supervision of the work, taking measurements of items of work carried out by the contractor and certification of bills of contractor.

2. Consultant has to conduct the field surveys, investigations, recommend tests including Non Destructive Tests (NDT) to be conducted by the contractor and prepare the Bill of Quantities (BoQ) as per the advice and guidance in the report submitted by IITB. Report of IITB is furnished in Appendix for reference.

3. While recommending NDT to be conducted, the consultant may refer the results of UPV tests of RCC members of basement floors already conducted by the Employer (NABARD) as published in the Structural Audit Report of NABARD, Head Office Building. If required, consultant may recommend for conducting UPV tests additionally on the basement RCC retaining wall at close intervals as per the report of IITB in the Appendix.

4. Before preparing the BoQ, the consultant may visit the site and conduct detailed surveying and investigations as per the guidelines in the report of IITB, preparing 2D detailed sketch with dimensions precisely indicating the distress zones of structural elements according to the requirement of NABARD. Then, preparing test recommendations, plans/methodology, preparing presentation wherein the details of the scheme may be explained in detail before senior management of NABARD and any doubt that may arise thereof may be clarified and changes, if any, suggested in the proposal may be incorporated as found suitable, to meet the needs of NABARD, so as to enable NABARD to approve the scheme.

5. Preparing preliminary project cost estimate on the finalised methodology, design, specification, and scheme and preparing report on the merits of the selected scheme, so as to enable NABARD to take a decision on the cost of the scheme as a whole and approve the same.

6. Appointing and instructing other consultants, such as Waterproofing consultants, Landscape consultants, Electrical consultants, other consultants etc. as per the requirement for the said works or part or portion thereof as may be considered necessary by NABARD at the Consultants own cost and paying the fees to such other consultant.

7. Preparing final project cost estimate and BoQ with detailed specifications and rate analysis according to latest DSR after incorporating necessary corrections, if any, as suggested by NABARD and submitting to NABARD. If any items are not in DSR, rates should be analysed according to the prevailing market rates.
8. Submitting the drawings as approved by NABARD to appropriate authorities and obtaining their approvals, wherever required.

9. Drawing up detailed tender documents for the work in all respects with specifications, drawings, schedule of quantities, time and progress charts and any other material necessary for completing the tender documents and get the same approved by NABARD. Suitable time schedule shall be worked out mutually for the completion of the above items.

10. Preparing complete final and detailed working 2D drawings with dimensions in MKS system as per the requirement if any. The Consultant shall get all these drawings approved by NABARD before releasing the same for execution or adoption. Consultant shall submit minimum 3 sets of final approved drawings of required size, legibly indicating dimensions and descriptions with a stamp of “Good for Construction” separately to NABARD for reference and for record.

11. Facilitating the selection of contractor through open bidding. Preparing the draft paper advertisement for Notice Inviting Tender (NIT) and submitting to NABARD for advertising, arranging and attending pre-bid meeting of contractors in consultation and jointly with NABARD and preparing the minutes of pre-bid meeting and submitting to NABARD for approval, attending tender opening process, scrutinising the Technical Bids, preparing select list/pre-qualified list of the bidders with the approval of NABARD after making visits to the bidders' work jointly with NABARD's representatives, if and as desired/required, scrutinising the Price Bids, preparing comparative statements of quotes of the contractors and submitting assessments and recommendations thereon, assisting NABARD to conduct negotiation with bidder wherever necessary, preparing contract documents after NABARD's decision on the tender and it's approval of award of work and getting the work executed by the contractor.

12. Preparing and submitting to the NABARD the requisite number (not less than three) of copies of the contract documents including all drawings, specifications and other particular and such further details and drawings as are necessary including soft copies, for use of NABARD, the contractors and the site engineers for the proper execution of the work.

13. Assuming full responsibility for design for all works, for the quality & quantity of the materials used in the work and installations and ensures that the construction is according to the designs, drawings and specifications.

14. Assuming full responsibility of Project Management Consultancy including day-to-day supervision, monitoring, quality control, co-ordination with NABARD and the contractors and reporting daily progress by posting sufficient number of qualified Site Engineer/Technical staff (a Graduate in Civil Engineer having minimum 2 years experience in Water proofing/structural repair work of RCC buildings or a three year Diploma holder in Civil Engineering with minimum 3 years experience in Water
proofing/structural repair work of RCC buildings) to ensure proper quality and timely execution of the said works as per BoQ and specifications. Bio-data of above technical staff with copies of proof of qualification and experience and Government identity certified by a Gazetted officer should be furnished to NABARD. Site Engineer shall be engaged full time during the progress of work on daily basis throughout the entire period of the Project for day-to-day supervision, ensuring smooth progress by prompt supply of details and giving proper guidance and also co-ordination with all the agencies engaged in the design engineering and execution of various items of work as required. The technical staff will invariably report to the department every day and keep the NABARDs officers involved updated. The Consultant shall have to coordinate his work with the works of all other trades wherever required.

15. During the course of the execution of the project doing any change in the scope/design with the approval of NABARD, taking measurements jointly with the contractors/contractors representatives after completion of every stage of items of work, recording measurements and quantities in specified Measurement Books at the site, preparation of computerized soft copies of measurements and quantities in spread sheets and certification of measurement sheets with sign and stamp in all pages of measurement sheet and submitting the certified measurement sheets to NABARD.

16. Preparing the rate analysis of extra / substitute items, if any, with respect to latest CPWD Delhi Schedule of Rates(if items are not available in DSR, cost may be analysed as per market rates) with due recommendations and submitting to NABARD for its approval.

17. Certifying the Running Account(RA) Bills and Final Bills of the contractors with due recommendations within specific time of submission of bill(within 7 days for RA bill and within 15 days for final bill) by the contractor and submit to NABARD for sanction so that NABARD shall be able to make payments to the contractor within reasonable time.

18. Preparing detailed comparative statement of works carried out with respect to approved awarded quantities with remarks and recommendations to excess and savings of quantities and submit to NABARD along with certified RA Bills/Final Bill.

19. Arranging fortnightly Progress Review Meetings with the contractor in presence of concerned NABARD officers. Review meetings will be held at DPSP, NABARD, Head Office, Mumbai. In the meeting, progress will be reviewed and issues related to smooth execution of the project will be discussed. The minutes of the meetings shall be recorded by the Consultant and get it approved by NABARD. Approved Minutes of review Meetings and decisions in the review meetings shall be communicated to the contractor and all concerned in writing by the Consultant within three days time of the review meeting.

20. Issue a virtual completion certificate after completion of work at site and submitting the final two sets of 2D drawings indicating the distress area and treatment carried out
of the completed work (as built drawings) with soft copies to NABARD. The work executed along with the completed drawings will be jointly inspected along with the contractor, consultant and NABARD before settling the final bill.

21. Any other services incidental to or connected with the said works usually and normally rendered by consultant and not referred to in any of the items referred to above.

22. The Consultant's association will continue from the beginning of the project work till its completion, settlement of the bills and during defect liability period. The Consultant will plan the works in such a way that the project could be completed within the scheduled time specified in the tender document of the project.

D. Details of distress to be addressed under the scope of consultancy

1. There are two basement floors upper basement and lower basement. There is regular water seepage from retaining wall into main water storage tanks situated at lower basement floor.

2. There are many spots in Lower and upper basements such as expansion joints, floor slabs, beams, and retaining wall where severe dampness and water seepage has been noticed.

3. Some spots at Roof slab where water leakage has been noticed during monsoon.

4. Structural distress at the points of seepage, leakage and dampness.

5. The above issues should be addressed with suitable, advanced and workable water proofing and structural repair methods for long term solution. In order to address the issues, consultancy should be performed as per the following steps:

   i). Detailed survey for Identifying and pin pointing the area of water seepage in basement floors and roof slab of NABARD, Head Office, Mumbai.

   ii). Suggesting various NDT tests to be carried out to identify/analyse the source of seepages, prescribe remedial measures to arrest the seepage/dampness and repair the structural defects due to seepage/dampness in line with the suggestions in the report of IITB and finalise the treatment in discussion with NABARD.

   iii). Prepare detailed report as per above survey and discussions and submit the report to NABARD.

   iv). Prepare Bill of Quantities, specifications, drawings and estimation for approval of NABARD

   v). Prepare tender document after approval of the estimation and assisting NABARD for tendering the work.
vi). Monitoring, supervision, taking the measurements, certification of bills, arranging periodical progress review meetings and ensuring quality implementation of the work within the specified time schedule.

E. Scale of charges:

The Consultant shall quote his/her remuneration in the Price Bid (Part-II) for the services rendered by him/her in relation to the said works and in particular for the services herein mentioned as the percentage of actual cost of the project excluding GST.

F. Method / Mode of payment:

The fees set out in Price-Bid (Part-II) herein shall be initially calculated and paid on the basis of the estimated value of the entire works as approved by NABARD till the work is awarded and thereafter as per accepted tender cost (s) and the same shall be paid proportionately upon completion of each stage of work as indicated below (The total fee, however, will be calculated and finally settled on actual cost of works including extra/substitute items):

i) 10% of the total fees after approval and finalisation of the scheme including submission and approval of the detailed estimate and relevant drawings for the project.

ii) 10% of the total fees after submission and approval of the tender documents for the project, scrutiny of tender documents and after awarding of the works to contractors

iii) 30% of the total fees after execution of 50% of the work.

iv) 30% after settlement of the final bill of the contractor.

v) 20% after the expiry of the defect liability period of the contractor’s work.

G. Time Schedule for assignment:

Following time schedule shall be generally followed by the Consultant for his important stages of consultancy assignment unless otherwise specified separately in the work order according to nature of the work:

<table>
<thead>
<tr>
<th>Stages of Assignment</th>
<th>Time Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submission of Initial Scheme after the date of Work Order</td>
<td>Within 21 days</td>
</tr>
<tr>
<td>Submission of Final scheme</td>
<td>Within 7 days of approval on corrected Initial scheme</td>
</tr>
<tr>
<td>Submission of draft detailed estimation with quantity and rate analysis.</td>
<td>Within 14 days of approval on Final scheme</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Submission of fair detailed estimation with quantity rate analysis.</td>
<td>Within 7 days of approval on draft detailed estimation</td>
</tr>
<tr>
<td>Submission of draft tender document with BOQ and drawings</td>
<td>Within 7 days of approval on detailed estimation.</td>
</tr>
<tr>
<td>Submission of fair tender document with BOQ and drawings</td>
<td>Within 7 days of approval on draft tender document</td>
</tr>
<tr>
<td>Scrutiny of Technical Bid, submission of scrutiny report with recommendations</td>
<td>Within 14 days of opening of Technical Bids.</td>
</tr>
<tr>
<td>Scrutiny of Price Bids, submission of Comparative statement with recommendations</td>
<td>Within 7 days of opening of Price Bids</td>
</tr>
<tr>
<td>Certification of RA Bill of the contractor and submission</td>
<td>Within 7 days of submission of RA Bill by the contractor.</td>
</tr>
<tr>
<td>Certification of Final Bill of the contractor and submission</td>
<td>Within 15 days of submission of Final Bill by the contractor.</td>
</tr>
</tbody>
</table>

**H. Terms and Conditions:**

1. Before quoting the fees, the Consultants shall visit and inspect the site and shall make his own assessment about the projects.

2. The fees will be calculated as the percentage quoted on the actual cost of works as executed as supervised by the Consultant and paid to the contractors. The items of works, which are carried out by NABARD directly, shall be excluded from the aforesaid actual cost to be taken into account for calculation of fee. The Consultant’s fee includes all the expenses related with local conveyance, TA, DA etc. for visiting to our office and site and inspection of works of bidders for shortlisting.

3. Consultant will be selected according to the lowest among total quoted rates of fees of the project. Lowest quoted bidder among the qualified bidders will be selected as consultant of the project.
4. Consultants are advised to insert Price Bid in separate sealed envelope inside the main envelope of the tender document and the inserted envelope shall be clearly superscribed as Price-Bid.

5. The Consultant shall depute sufficient number of technical personnel in the project for daily supervision, monitoring, quality control and measurements to ensure smooth progress of the project as scheduled. Out of the technical personnel one should be a Graduate in Civil Engineer having minimum 2 years experience in Water proofing/structural repair work of RCC buildings or Three year Diploma holder in Civil Engineering with minimum 3 years’ experience in Water proofing/structural repair work of RCC buildings.

I. Termination of Agreement:

a) The agreement herein may be terminated at any time by NABARD and consultant by giving a written notice of 15 days and 30 days respectively to the other party. Even after the termination of their employment, the Consultant shall remain liable and be responsible for due certification of the works done hitherto and acts performed till termination and approval of any bills submitted by the contractors at any time in respect of the works executed till such termination. If any winding up proceedings are contemplated or initiated against the Consultant, NABARD shall be entitled to terminate the agreement and entrust the work to any other Architect.

b) If the Consultant shall close their business or die or become incapacitated from acting as such Consultant, then the Agreement shall stand terminated.

c) In case

(i) the Consultant fail to adhere to the time schedule stipulated in the para-G herein or the extended time which may be granted by NABARD in its sole discretion, or

(ii) there is any change in the constitution of the Consultant’s company or firm for any reason whatsoever, NABARD shall be entitled to terminate this Agreement, after due notice, and entrust the work to some other Consultants.

d) In case of termination under sub-clauses (a) or (b) or (c), the Consultants shall not be entitled to fees, or compensation, except the fees payable to them up to the stage of work actually done, which shall be decided and determined by NABARD.

e) In case of termination under sub-clause (a) or (b) or (c), NABARD may make use of all or any drawings, estimates or other documents prepared by the Consultant, after a reasonable payment up to the stage of work done for the services of the Consultant for preparation of the same in full as provided herein, provided always that all the sanctions and approved plans/designs and other drawings shall remain the property of NABARD and the same shall be surrendered by the Consultant to NABARD within ten days from the date of such termination, without demur.
J. Damages:

Notwithstanding what is contained in clauses herein above, if NABARD is put to any loss or suffers any damages (including cost escalations in execution of the said works) due to delays in carrying out the obligations under these terms or negligence, indolence or breach of any of the terms and conditions herein contained on the part of the Consultant, whether the cause for such loss or damage is immediate or remote, the Consultant shall be liable not only to forgo their fees for the quantum of work thus done but also make good losses and damages on a written demand made by NABARD and a certificate issued by NABARD as regards the amount of such loss or damage shall be final and conclusive as between NABARD and the Consultant and shall not be questioned either inside or outside a Court, tribunal or arbitration. Such loss or damage, if not reimbursed within the time stipulated by NABARD, shall, without prejudice to NABARD's right to recover the same in accordance with the law, be recovered by NABARD from any sums payable to the Consultant, either under this contract or any other contract made between NABARD and the Consultant for any other works belonging to NABARD, provided always that such damage or loss recoverable from the Consultant shall not be more than 10% of the fees payable to them under the contract. Provided further that, in addition to what is contained herein above in this clause, the Consultant shall indemnify NABARD through a Professional Liability Insurance Policy to be taken at his cost with a Nationalised Insurance Company to the extent of the full amount of fees to be charged by the Consultant on the basis of estimated cost of works. Such policy shall be obtained and deposited with NABARD within a period of 2 months from the date of execution of this presents and shall be kept valid by the Consultant during the subsistence of this Contract.

K. Transfer of Interests:

The Consultant shall not assign, sublet or transfer their interest in this Agreement, without the written consent of NABARD.

L. Article of Agreement:

The Consultant has to sign the agreement as per attached “Article of Agreement” (Annexure – A). This agreement shall be executed in duplicate and NABARD shall retain the original and the Consultant shall retain the duplicate. The Consultant shall bear the Stamp Duty on the original as well as the duplicate of this Agreement.

M. Dispute Resolution:

If any dispute, difference or question shall at any time arise between Consultant and NABARD the same shall be settled as Arbitration Clause mentioned in “Article of Agreement”
N. Services continued to be rendered not withstanding any reference or dispute to the arbitration:

It is specifically agreed that the Consultant shall continue to render its/his/her services provided herein with all due diligence, professional skill and tact notwithstanding that any matter, question or dispute has been referred to arbitration, if any.

Accepted all terms & conditions

Date :-
Place :-

( Signature)
Name, Address and Seal of the Consultant
## I. PROFORMA:

Information to be furnished by the Consultant:

**BASIC INFORMATION**

<table>
<thead>
<tr>
<th>Sl.</th>
<th>Particulars</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Name of the organization</td>
<td>Attach documentary proof also</td>
</tr>
<tr>
<td>2</td>
<td>Type of Organisation- Whether Proprietorship, Partnership</td>
<td>Attach documentary proof also</td>
</tr>
<tr>
<td>3</td>
<td>Name of the Proprietor/Partners/Directors in the organisation</td>
<td>Attach documentary proof also</td>
</tr>
<tr>
<td></td>
<td>(a)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(b)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Details of Registration (Firm, Company etc.) Registering Authority, Date, Number etc.</td>
<td>Attach documentary proof also</td>
</tr>
<tr>
<td>5</td>
<td>Details of professional Registration(Institution of Engineers(India) or similar professional bodies of Structural Engineers etc.)</td>
<td>Attach documentary proof also</td>
</tr>
<tr>
<td>6</td>
<td>Experience in the respective field of work</td>
<td>Attach documentary proof also</td>
</tr>
<tr>
<td>7</td>
<td>Name and address of the Bank/Bankers. (Provide SB / CA no. IFSC, etc.)</td>
<td>Attach documentary proof also</td>
</tr>
<tr>
<td>8</td>
<td>Yearly turnover of the organization for the last 3 years ending 31st March 2019</td>
<td>Attach documentary proof also</td>
</tr>
<tr>
<td></td>
<td>(Please, enclose copy of Audited Final Accounts in support.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Year 2016-17</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2017-18</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2018-19</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>a) Registered Office address and Telephone number</td>
<td>Attach documentary proof also</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>b) Office address with landline phone numbers through which the work will be handled in Mumbai.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Whether working with any of the Govt. /Semi Govt. Undertaking/s as approved consultant and if so, furnish details in Statements-II &amp;III.</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Whether any technical personnel are employed in the organization and if so, give details of their experience, qualification etc. Statement – I</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Indicate if involved in any litigation, arbitration or any civil suits pending in any of the works executed during last 10 years/being executed. If yes, please furnish the name of the project, employer, nature of work, contract value, work order and date and brief details of litigation. Attach a separate sheet if</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Kindly mention if your firm/agency/company is blacklisted/ debarred by any organization/firm mention the relevant details</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>PAN No</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Important major consultancy assignment completed in the relevant field (works having proforma (Statement II) individual cost of Rs 20 lakh and above only). The full postal address of the clients including their contact telephone numbers.</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Important major consultancy assignment in the relevant field (works having individual proforma (Statement III) cost of Rs 20 lakh and above only) on which the firm is engaged at present The full address of the clients and their contact telephone numbers shall be indicated against each assignment.</td>
<td></td>
</tr>
</tbody>
</table>

Note: Statements I, II & III are enclosed.

Signature of the applicant  
( with seal)
STATEMENT - I

List of professional staff with the consultant, giving their qualification, experience, including that in the present organisation*

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name</th>
<th>Age</th>
<th>Qualification</th>
<th>Experience</th>
<th>Nature of works handled</th>
<th>Name of the assignments handled</th>
<th>Date from which employed in the present organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
</tbody>
</table>

* Use separate/additional sheets as per the requirement

Signature of the Bidder with full address and office seal

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.
<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of the Work including name of the building and location.</th>
<th>Nature of consultancy involved in the contract</th>
<th>Name of the owner and indicate whether it is a State Govt./Govt. of India undertaking or Pvt. body with full address and telephone numbers.***</th>
<th>Completion Period</th>
<th>Cost of the Work ** (Rs in lakh)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Stipulated</td>
<td>Actual</td>
</tr>
</tbody>
</table>

* Mention the assignment executed only within the last 7 years ending 30.11.2019. Use separate/additional sheets as per the requirement
** Mention the projects where cost of the work Rs 20 lakh and above only.
*** Attach clients' certificates clearly indicating scope of works

Signature of the Bidder with full address and office seal:

[Signature]

20
### STATEMENT - III

List of important Water Proofing Consultancy assignments ON HAND being executed by the consultant*

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of the Work including name of the building and location</th>
<th>Nature of consultancy involved in the contract</th>
<th>Name of owner and indicate whether it is a State Govt./Semi-Govt./Govt. of India Undertaking or Pvt. Body with full address and telephone numbers.***</th>
<th>Stipulated date of completion</th>
<th>Expected date of completion</th>
<th>Present stage of work with reasons if the work is getting delayed</th>
<th>Cost of the work ** (Rs in lakh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Use separate/additional sheets as per the requirement

** Mention the projects where cost of the work Rs 20 lakh and above only.

*** Attach clients certificates indicating scope of works

Signature of the Bidder with full address and office seal:

![Signature Image]
ANNEXURE-A

ARTICLES OF AGREEMENT

( On a Non- Judicial stamp paper of requisite value)

THIS AGREEMENT is made at Mumbai on this ...... day of _____ 2019

BETWEEN

National Bank for Agriculture and Rural Development, a body corporate incorporated under the National Bank for Agriculture and Rural Development Act, 1981 having its Head Office at C-24, ‘G’ Block, Bandra-Kurla Complex, Bandra (East), Mumbai-400 051, herein after referred to as “NABARD” (which expression shall unless repugnant to the context or meaning thereof be deemed to include its successor and assigns) of the ONE PART.

AND

M/s ................................................................. (Proprietorship/partnership firm/Company) incorporated/registered under ..................................................Act, ........., and having its place of business at .................................................................

hereinafter referred to as ‘Consultant/Service Provider’ (which expression shall unless repugnant to the context meaning be deemed to include the legal heirs, legal representatives, administrators and executors) of the OTHER PART.

WHEREAS

1. NABARD is desirous of engaging Consultants for “Consultancy and Project Management services for Water Proofing and related structural repair works of Basement floors (Lower Basement and Upper Basement) in NABARD, Head Office premises (Hereinafter referred to as the said premises)” as specified in the scope of work and whereas the Consultant has offered to undertake the said work at the said premises as per the scope of work and details indicated in the instructions/tender documents.

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

3. The Consultant has agreed to execute upon and subject to the conditions set forth in the Tender, Price Bid and this agreement (all of which are collectively hereinafter referred to as “the said Conditions”) the work shown upon the said Technical Bid, 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”).

4. NABARD in consideration of the conditions and convenants to be observed by the Consultant has agreed to permit the Consultant to render the service of “Consultancy and Project Management services for Water Proofing and related structural repair works of Basement floors (Lower Basement and Upper Basement) in NABARD, Head Office, Mumbai” (Hereinafter referred to as the said work) as hereinafter set out.

NOW, THE AGREEMENT WITNESS THAT IT IS MUTUALLY AGREED BY AND BETWEEN THE PARTIES:-

1. The contract shall commence from ................. and shall continue till ................... (for a period of ...... years) unless it is curtailed or terminated by NABARD owning to deficiency of services, sub-standard quality of service, breach of contract, reduction or cessation of the requirements etc.

2. The contract may be extended for further period/s after the expiry of the initial period of ........ year or, as such the extended period as the parties mutually decide. NABARD shall, in that event, make a request in writing in this behalf to the Consultant/Service Provider one month prior to the expiry of the current contract/extended contract and upon such request, the Consultant/Service Provider shall provide the services to NABARD at the said premises, on the same terms and condition for a further specific period mutually agreed upon by the parties.

3. NABARD shall pay to the Consultant/Service Provider fee:

   a) For the services to be rendered by the Consultant in relation to the said works, an amount calculated at the rate of ______ (percent) of the actual cost of this project. The GST (Goods and Services Tax) at the applicable rate will be paid extra by NABARD. Statutory deductions as per the prevailing rules will be made from the payment.

   b) This contract is a stage-wise payment contract for the complete work to be paid for according to preparation of the scheme, estimation and tender document, scrutiny of tenders, recommendations to award the work, supervision, monitoring, measurements, scrutiny and certifying the bills, certifying virtual completion and for achieving the desired performance in completing the specified work in the tender at the rate contained in the Schedule of Rates or as provided / mentioned in the said conditions. ; however,
NABARD shall be entitled to adjustments subsequently to secure that the total fee payable to the Consultant/Service Provider does not exceed the aggregate of the percentages referred to in sub-clause (a) above on the value of works actually executed and completed. NABARD, shall, however have the liberty to omit, postpone or not execute any work and the Consultant shall not be entitled to any compensation or damages for such omission, postponement or non-execution of the work, except the fee which have become payable to them for the services actually rendered by them.

4. In consideration hereinafter mentioned, the Consultant will upon and subject to the conditions annexed, carry out and complete the said work, described by or referred to in the Scope of work in the Technical Bid and in the said conditions.

5. Time shall be considered as the essence of this contract, and the Consultant hereby agrees to complete the entire work within the time period prescribed in the tender reckoned from the date of issue of work order. NABARD shall pay the Consultant the said contract amount or such sum as shall become payable at the times and in the manner specified in the said conditions and the amount will be exclusive of GST.

6. The terms and conditions as enumerated in tender dated .................., the said conditions and Appendix attached thereto are part and parcel of this contract and binding on the parties. The Consultant shall ensure that all items of work specified in the scope of work is attended to.

7. NABARD reserves to itself the right of altering the nature of work by adding to or omitting any items of works or having portions of the same carried out without prejudice to this contract.

8. The Consultant/Service Provider shall not have claims of Master and Servant relationship (implicitly or explicitly) between him/her/them and NABARD nor have any principal and agent relationship with or against NABARD. The Consultant/Service Provider shall not claim any benefit/ compensation /absorption /regularization of services under the provisions of the Industrial Disputes Act, 1947 or Contract Labour (Regulation & Abolition) Act, 1970.

9. NABARD shall not be responsible for any damages, losses. Claims, financial or other injury to any person/s engaged by Consultant in the course of their performing the functions/works, or for payment towards any compensation.

10. The Consultant shall keep NABARD indemnified against all claims whatsoever in respect of workmen deployed by it in NABARD. In case any employee of the Consultant so
deployed enters in dispute of any nature whatsoever, it will be the primary responsibility of the Consultant to contest the same. In case NABARD or its employee is made party and is supposed to contest the case, NABARD will be reimbursed for the actual expenses incurred towards Counsel Fee and other expenses which shall be paid in advance by the Consultant to NABARD or any person authorized by NABARD, on demand. Further, the Consultant will ensure that no financial or any other liability comes to NABARD or its employee in this respect of any nature whatsoever and shall keep NABARD or any employee of NABARD indemnified in this respect.

11. The Consultant shall ensure proper conduct of its personnel in NABARD’s premises, and enforce prohibition of consumption of alcoholic drinks, paan, smoking, loitering without work.

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

13. In case any of documents furnished by the Consultant 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.

14. NABARD reserves the right to withdraw/relax any of the terms and conditions mentioned above so as to overcome the problem encountered by the contracting parties.

15. If the Consultant becomes insolvent or found to have offered any bribe in connection with the contract or the consultant 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 consultants any loss suffered by NABARD on account of the contract being terminated.

16. The Consultant shall not transfer, assign, pledge or sub-contract its rights and liabilities under this contract to any other agency without the prior written consent of NABARD.

17. 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 Consultant shall not be entitled to any compensation in the event of such termination. However, in normal course the agreement can be terminated by the Consultant by giving 30 days’ notice and by NABARD by giving 15 day’s notice.

18. Vacation of Premises on Termination of agreement - On the expiry or earlier termination of this agreement the Consultant shall remove himself and his workmen from the premises and all articles belonging to him.
19. **Dispute Resolution.**

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.

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 Consultant a list of three names of persons who shall be presently unconnected with NABARD. Consultant 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 Consultant 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 Consultant.

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. The award shall be final and binding on both the parties.

20. Work under the Agreement shall be continued by Consultant 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 Consultant 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.
21. The reference to the Chief General Manager in this agreement and the schedules hereto annexed shall mean the Chief General Manager, DPSP, NABARD, Head Office, C-24, G-Block, Bandra Kurla Complex, Mumbai – 400 051 and shall include, in respect of any power exercisable by him or NABARD under this agreement and any other officers of NABARD designated by him in that behalf from time to time.

22. Any notice, for the purpose of this contract, has to be sent in writing to the other party by facsimile transmission, by registered post with acknowledgement due or by a reputed courier service. All notices shall be deemed to have been validly given on (i) the business day immediately following the date of transmission with confirmed answer back, if transmitted by facsimile transmission, or (ii) the expiry of 5 days after posting, if sent by post, or (iii) the business date of receipt, if sent by courier.

23. The agreement shall be interpreted and have effect in accordance with the law of India.

24. This agreement is being executed in duplicate, NABARD shall keep the original and the Consultant shall keep the duplicate.

25. The Consultant shall bear the expenses for stamp duty on this agreement for both the original and the duplicate copy.

In witness whereof the parties hereto, have caused their presence to be signed on the above by their duly authorised officials at the place and on the day, month and year first herein above written.

Signed, sealed and delivered
by Shri

Signed, sealed and delivered
by Shri

CGM/GM/DGM
for & on behalf of NABARD

the duly authorized signatory
for & on behalf of the
Consultant

In the presence of
1.

In the presence of
1.

2.

2.
INDEMNITY BOND
(On Rs.500/- Stamp Paper)

KNOW all men by these presents that I, Shri.............................................. duly authorized by 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-Kurla Complex, Bandra(E) Mumbai-400051.

WHEREAS NABARD has engaged M/s................................................... as the Consultant for their Proposed work “Consultancy and Project Management services for Water Proofing and related structural repair works of Basement floors (Lower Basement and Upper Basement) in NABARD, Head Office, Mumbai”.

THIS DEED WITNESSETH AS FOLLOWS :-

I/We M/s .................................................. hereby do Indemnify, and same harmless NABARD 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 consultancy service, negligence, faulty instructions for construction and/or for violating any law, rules and regulations in force, for the time being while executing/executed works,

any damages, loss or expenses due to or resulting from negligence or breach of duty on the part of me/us or any sub-consultant/s if any, employee/site Engineers/Supervisors appointed by me.

any claim by an employee of mine/ours or of sub-consultant/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-consultant/s if any, our/their employee which may involve any loss, damage liability, civil or criminal action.

IN WITNESS WHEREOF THE M/s .................................................. has set his/their hands on this ..........day of .......... 2019.
SIGNED AND DELIVERED BY THE AFORESAID M/s
IN THE PRESENCE OF WITNESS:

(1) ........................................

(2) ........................................
APPENDIX

REPORT AND REPAIR METHODOLOGY SUGGESTED BY IIT BOMBAY

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 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.

**Detailed Specifications**

Detailed specifications for the repair methodologies recommended are given below:

by you.

i. **Injection grouting of effected surface:** 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, application of **polyurethane grout** with detailed specification is given below:
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.

iii. **Structural overlay** is another treatment methodology that has been recommended as per the requirement, and the detailed specification is given below:

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.

iv. **Treatment methodology** for leakage at the **expansion joints** in the basement floors:

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

v. Specification of **waterproofing** of basement slab at ground level including uprooting and removal of trees above the basement floor:

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 polyurethane 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.

vi. General suggestion for successful treatment of structural elements waterproofing
1. Proper surface preparation
2. Meticulous application of selected waterproofing materials and techniques.
Protection of the applied waterproofing materials.